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# Electric Light & Power

THE NEWS MAGAZINE OF ELECTRIC UTILITY MANAGEMENT AND TECHNOLOGY
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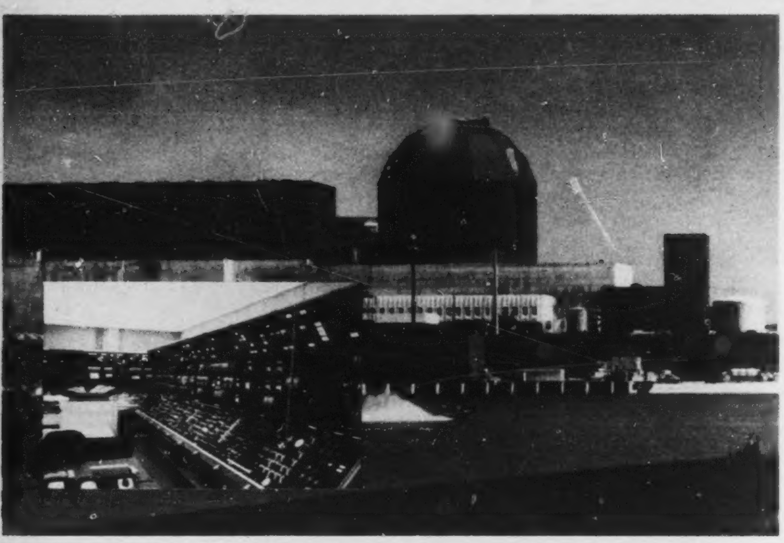

Illinois Power Co.'s 950-MW Clinton plant comes on-line after 12 years of construction. A multi-sided vapor barrier covers the conventional containment vessel to provide added protection to the environment. At left, the plant is equipped with a complete control-room simulator for operator training. The red telephone in the foreground would provide a direct line to the Nuclear Regulatory Commission. An open operating manual can be seen in the background.

## Illinois Power's Clinton nuclear power plant finally goes on-line

DECATUR, IL—After 12 years of construction, Illinois Power Co.'s Clinton nuclear power station was expected to operate at full power by *EL&P* press time.

Construction for the 950-MW plant began in 1976 at a projected cost of $429 million. Final cost for the redesigned plant is estimated at $4.25 billion, an IP spokesman said.

Final testing included the "warranty run" test of the power plant's nuclear steam supply system, 100 hours of operation at 100-percent power, which was completed in October. Other tests related to automatic plant shutdown were then performed. After that, 37 days were needed to conduct "surveillances," required periodic tests to demonstrate that systems would operate as designed.

Al Adams, an IP spokesman, said the utility expects full-capacity operation from its first nuclear plant. Coal plants have provided over 98 percent of IP's generation in the past. Clinton, at full power, would provide about 17 percent of the company's requirements, he said.

IPCo anticipates filing for a rate increase related to Clinton by early 1988, Adams suggested.

About $1.5 billion of the plant's cost already has been incorporated into rates, he added. However, two audits for the Illinois Commerce Commission recommended that the company not be allowed to recover between $294 million and $463 million in costs the studies called imprudent. Three firms hired by IP for audits found no imprudence. Those reports are to be presented to the ICC for consideration and a final ruling, Adams said.

IP has about 540,000 electric customers in regions in central and southern Illinois.

## *PSNH gains on Seabrook woes*

MANCHESTER, NH—Public Service of New Hampshire has received some encouraging news about its troubled Seabrook nuclear plant, as reported in November's *EL&P*, and about the plant's impact on its finances. The NRC has ruled that utility-prepared emergency evacuation plans are sufficient for giving its approval for operation if local and/or state officials refuse to submit one of their own. A decision about Seabrook startup is expected before year-end.

PSNH, a 35.6-percent owner of Seabrook, has about $2 billion, nearly 70 percent of its assets, invested in the still-idle plant. The company filed reorganization plans to avoid forced bankruptcy proceedings for not making interest and principal payments on $800 million in debt.

A number of evolving issues may decide the fate of PSNH and Sea-

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## *Utilities give investors security during stock market's wild ride*

Mark T. Hoske
Assistant Editor

During times of Wall Street crisis, investors flock to utility stocks for steady strength, safe principals and generally high yields, analysts agree.

Mark D. Luftig, with the New York-based Salomon Brothers Inc., said many investors sold industrial stocks during October's panic market and moved toward utilities because of their high quality and secure, regulatory environment.

For October, the Standard & Poors listing of electric companies outperformed all other groups with only a 3.5-percent loss in value. The Dow Jones Industrials were down 21.8 percent for October.

Luftig called the move a "big shift toward quality."

"I think people are going to stay with utilities. Between now and early next year it looks like an attractive place to be," Luftig projected.

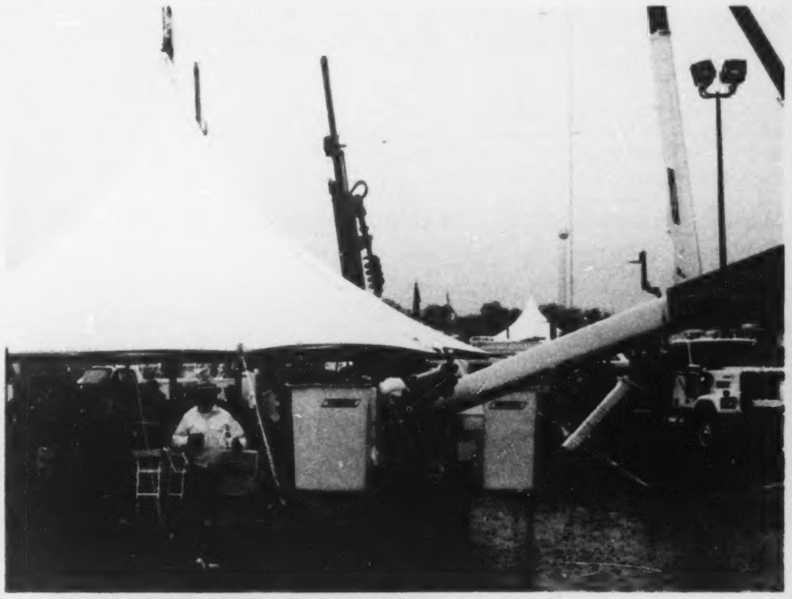
### Down slightly among big losses

Edward Tirello, from Shearson Lehman Brothers Inc. in New York, said while the rest of the market plunged, utility stocks were down just 2 percent from Sept. 30 through the first week in November.

"There's a flight to quality now and the highest quality stock is utility stock." Utilities are attractive, he explained, because they protect investors' principal and generally provide

Continued on page 6

## 'The rain in Spain'...and at ICUEE '87 too



The first day of the 1987 International Construction and Utility Equipment Exposition (ICUEE) was wet enough to attract ducks and frogs, but the weather improved thereafter and attendees had two great days to enjoy the world's largest hands-on working trade show. Held for the first time at the Kentucky Fair and Exposition Center in Louisville, ICUEE drew more exhibitors and more attendees than ever before. A photo review appears on pages 8-9.

## *Savannah Elec. merges into Southern Co.*

SAVANNAH, GA—Savannah Electric & Power Co. will be merged into the Southern Company, according to an announcement by the Boards of Directors of the two utilities.

The merger is subject to approval by Savannah Electric shareholders and the Securities & Exchange Commission.

Savannah Electric will continue to be headquartered in Savannah and its current management will retain operating responsibility. The company will have the same relationship to the Southern Company as other independent operating subsidiaries, such as Alabama Power, Georgia Power, Gulf Power and Mississippi Power.

While Savannah's common stock will be exchanged for Southern Company common, its existing debt securities, and its preferred and preference stock, will remain outstanding.

### Mutual benefits

In a joint statement, Southern Company president Edward L. Addison and Savannah Electric president Arthur M. Gignilliat, Jr. said the merger is a logical and natural business combination. Participation in the Southern electric system power pool will allow Savannah to cancel plans for needed capacity in the late 1980s. The Southern Company gains by addition of Savannah's economically strong service territory and access to the state's major deep-water port.

# News Briefs

JILL MINNER, Assistant Editor

## Stone & Webster Engineering Corp. forms new subsidiary

● A new subisidiary, Stone & Webster Environmental Services, Inc., has been established by Stone & Webster Engineering Corporation. The company said its new unit, headquartered in Boston, will provide multidisciplinary environmental services to federal, state and municipal agencies, electric utilities and industrial companies.

## Sherco 3 generating plant begins commercial operation

● The 800-MW Sherco 3 generating plant began commercial operation recently, according to its owners Northern States Power Co. (NSP) and Southern Minnesota Municipal Power Agency. NSP said its $1-billion, coal-fired unit started ahead of schedule and below the original budget. "This achievement is the result of an extraordinary cooperative effort among highly-skilled craft workers, contractors and managers," stated Roland J. Jensen, NSP vice president-engineering and construction. According to NSP, which acted as construction manager and overall project manager, Sherco 3 is Minnesota's largest construction project ever.

## Westinghouse Hanford expert given French scientific medal

● Westinghouse Hanford Company's James J. Laidler has been awarded the 1987 Charles Eichner medal of the French Metallurgical Society. Laidler was honored for his achievements in developing improved alloys for nuclear applications, according to Westinghouse. Sponsored by the French Atomic Energy Commission, the award is given to an expert in metallurgy who has made exceptional contributions in the field of nuclear power. The company said that this is the first time the award has been given for a Hanford-related activity.

## NRECA/EPRI video shows value of research and development

● The National Rural Electric Cooperatives Association (NRECA) and the Electric Power Research Institute (EPRI) said they have produced a videotape which protrays the value of research and development to rural electric cooperatives, to the general utility industry and to the American culture. *The R&D Harvest* includes interviews with Sen. John Glenn, Buckeye Power Co. President Bob Cleveland, Jackson County Rural Electric General Manager Don Clodfelter, and Richard Balzhiser, executive vice president of R&D for EPRI. The film highlights rural electrification's historical roots; rural electric case studies of EPRI/NRECA R&D product use; the importance of R&D in putting John Glenn into space; superconductivity as an example of technology to maintain America's R&D preeminence; the consumer cost of R&D and more. For further information contact Ellie Hollander at EPRI (202) 293-7513, or Lowell Endahl at NRECA (202) 857-9598.

## CLECO appoints Terbot chairman, names Brame president

● Central Louisiana Electric Company, Inc. selected William F. Terbot as chairman and chief executive officer and appointed Scott O. Brame as president, chief operating officer and a member of the board. Terbot has been president and CEO of the company since 1985, and Brame served as senior vice president of finance and rates since 1974.

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**EL&P readers whose responsibilities include both Generation and Transmission/Distribution receive both technology sections. Other readers receive the technology section that applies to their respective area of responsibility. The Generation edition is indicated by a single dot (·) in the upper right corner of page 1; the T/D edition carries two dots (··). All readers receive EL&P's industry news section.**

## Public Service Indiana Board approves holding company plan

● A plan to form a holding company for Public Service Indiana (PSI) has been approved by the PSI Board of Directors. "Our board of directors and the management of the company believe the reorganization will provide a more flexible structure and a greater opportunity to grow in today's changing business climate," explained PSI Chairman and CEO Hugh A. Barker. If the plan is approved by the company's shareholders at the annual meeting in April, all shares of PSI common stock will be exchanged for shares of holding company common stock—existing preferred stock of PSI would remain as a security of PSI.

## Top management transition planned at Minnesota Power

● Minnesota Power chairman and CEO Jack F. Rowe has announced plans to retire in May 1989 after 39 years of service. Rowe said he will step down as CEO in May 1988 and as chairman in May 1989. Arend J. Sandbulte, the utility's president and chief operating officer, has been named to succeed Rowe as chief executive officer. Sandbulte was chief financial officer from 1976 to 1984, served as president since 1984, and has been deeply involved with Rowe in strategic planning efforts, according to Minnesota Power. The company has prospered under Rowe's leadership and in 1986 was named 'Electric Utility of the Year' by *Electric Light & Power*.

## BBC Brown Boveri's plans may boost future group's position

● BBC Brown Boveri, Ltd. recently signed a letter of intent with GE USA to purchase its shares of Sadelmi S.P.A., according to Brown Boveri. If the letter is approved by both companies' board of directors, Sadelmi will then become part of the forthcoming ASEA Brown Boveri Group's Power Lines Division. In addition, Brown Boveri announced that it had signed a preliminary contract with Italmobilaire S.P.A. to share financial and technological interests in the electromechanical market. The company said the move will strengthen ASEA Brown Boveri Group's position in Italy's power generation, industrial equipment and automation markets, and that the Sadelmi purchase will help the Power Lines Division become a worldwide industry leader.

## SDG&E subsidiary buys pollution control equipment supplier

● San Diego Gas & Electric Company said its wholly owned subsidiary, Pacific Diversified Capital (PDC) has acquired Wahlco, Inc., a supplier of air pollution control equipment to the electric utility industry. Wahlco manufactures and distributes flue gas conditioning systems and is the fourth purchase PDC has made in the last twelve months, according to the utility.

## SEI to evaluate the effectiveness of industry drug programs

● Southern Electric International, Inc. (SEI), a subsidiary of The Southern Company, has signed a contract with the National Institute on Drug Abuse to study the effectiveness of drug programs conducted by business and industry. SEI said the two-year study will compare employee productivity, absenteeism and morale before and after the initiation of drug testing programs. "We're optimistic that the results of this study will lead to a more complete understanding of drug issues in the work place," stated Charles Parker, manager for facilities and resource services at SEI. "That knowledge should prove beneficial to all American industry," he added. SEI was established in 1982 to market the technical and managerial expertise of Southern's electric system.

## NU receives six awards for its energy conservation programs

● The State of Connecticut Energy Division has presented Northeast Utilities (NU) with six Energy Innovation Awards for the utility's work in promoting conservation. NU said its award-winning projects include: a campaign to market energy-efficient lighting; a guidebook for architects on energy-efficient design; comprehensive conservation projects at two high schools; a weatherization revolving loan fund to help low- and moderate-income customers finance conservation measures; and a partnership with Connecticut Light & Power Company's nonprofit human service agency customers to show how grants can make energy conservation affordable.

## Virginia Power, foundations to sponsor scholarship program

● In cooperation with Virginia Power, the Thomas Alva Edison Foundation and the Max McGraw Foundation have announced plans to sponsor the Eighth Annual International Thomas Edison/Max McGraw Scholarship Program. The purpose of the program, which is open to all high school students, is to encourage and recognize outstanding students interested in pursuing science or engineering careers or otherwise demonstrate the creativity and perseverance of Edison and McGraw. Twelve scholars will be named as well as two grand award scholars, according to the foundations. Virginia Power said it will give a separate $1,500 local award to a student from its service area.

## Electric Utility Market Research Council celebrates 25 years

● The Electric Utility Market Research Council, an affiliate of the American Marketing Association, marked its 25th anniversary at its fall meeting in Houston, TX. Council members from 28 investor-owned utilities attended the meeting, which was hosted by Houston Lighting & Power Company. "We hope to continue sharing information among different utility systems as well as expand our visibility and assistance in the use of state of the art market research techniques within the industry," stated David Mercurio, council president and manager of market analysis at Public Service Indiana.

# Utilities spend $564M on 1986 RD&D, cites report

DENVER—One-hundred-twenty, investor-owned utilities spent $563.7 million on research, development and demonstration in 1986, representing 0.45 percent of their electric revenue, according to *The TECC Guide to U.S. Electric Utility RD&D Funding 1986-1987*.

The report says 120 utilities spent more than $100,000 during 1986 on RD&D. The average was $4,697,280 each. That amounts to 2.33 percent of net electric operating income, $7.57 per electric customer, $1,184 per electric department employee or $0.29 per MWh sales. (See table for listing of top 20 in two categories.)

TECC Group Inc., a consulting firm for research and technology management, compiled the report from individual 1986 FERC Form No. 1 reports, utility annual reports and correspondence with utilities, explained James R. Schetter, TECC president.

Schetter said this was the first year TECC compiled the guide. When compared to other industries, utilities seemed to spend less on RD&D, perhaps because of the regulated environment, he suggested, though parallel figures were unavailable.

### Comparison tricky

Comparing utilities is tricky, Schetter warned, because each state has its own regulatory environment. In New York, for example, law prohibits utilities from spending more than 1 percent of revenue on RD&D, he said. Also, utilities unfamiliar with a technology may spend more, as when a utility constructs its first nuclear plant.

Ratios are sometimes skewed due to accounting manuevers, such as deferred funding, he added. Such differences are pointed out in the report, said Schetter.

If the industry sees more deregulation, utilities will put a greater emphasis on RD&D, because of greater competition, he suggested.

The 130-page guide names 120 utilities, RD&D contact persons, 1986 RD&D funding in 12 major catagories and five comparitive RD&D funding ratios.

*The TECC Guide to U.S. Electric Utility RD&D Funding 1986-1987* is $149 and available by calling (303) 973-1777.

### California may change RD&D rule

In a separate development, the California Public Utilities Commission proposed a change to remove review and funding of RD&D programs of Pacific Gas & Electric, Southern California Edison, San Diego Gas and Electric and Southern California Gas companies from the utilities' general rate cases. RD&D funding should be reviewed in a separate proceeding, California's PUC suggested.

The PUC proposed the change because RD&D is a unique area of utility operation, which should be given special review outside the context of a general rate case.

The PUC noted that utilities don't always spend authorized RD&D money, may record it in varied ways or combine research projects. Guidelines should be made for planning and reporting RD&D projects, the PUC added.

A predetermined level of funding, annually adjusted for inflation, could sustain and maintain research progress and protect ratepayers, the PUC maintained.

## 1986 Top 20 Utilities RD&D Funding

| Rank | Utility | RD&D in $1000s |
|---|---|---|
| 1 | Southern California Edison* | 51,010 |
| 2 | Pacific Gas & Electric* | 31,169 |
| 3 | Niagara Mohawk Power* | 29,759 |
| 4 | Consolidated Edison of NY* | 29,188 |
| 5 | San Diego Gas & Electric* | 23,851 |
| 6 | Duke Power* | 23,259 |
| 7 | Commonwealth Edison | 20,571 |
| 8 | Georgia Power* | 19,265 |
| 9 | Texas Utilities Electric Co. | 17,785 |
| 10 | Public Service E & G* | 16,772 |
| 11 | Houston Lighting & Power | 14,482 |
| 12 | Florida Power & Light | 13,608 |
| 13 | Philadelphia Electric* | 13,324 |
| 14 | New York State E & G* | 10,918 |
| 15 | Alabama Power | 9,748 |
| 16 | Ohio Power* | 9,739 |
| 17 | Carolina Power & Light | 8,975 |
| 18 | Pennsylvania Power & Light | 8,168 |
| 19 | Union Electric | 7,311 |
| 20 | Connecticut Light & Power | 6,841 |

| Rank | Utility | RD & D Funding As A % of Revenue |
|---|---|---|
| 1 | Central Hudson G & E | 1.80% |
| 2 | San Diego Gas & Electric* | 1.79% |
| 3 | Niagara Mohawk Power* | 1.41% |
| 4 | New York State E & G* | 0.99% |
| 5 | Southern California Edison* | 0.96% |
| 6 | Iowa Public Service Co. | 0.85% |
| 7 | Orange & Rockland Utilities | 0.83% |
| 8 | Rochester Gas & Electric | 0.81% |
| 9 | Ohio Power | 0.73% |
| 10 | Consolidated Edison of NY* | 0.69% |
| 11 | Duke Power* | 0.68% |
| 12 | Pennsylvania Electric | 0.59% |
| 13 | Wisconsin Electric Power | 0.58% |
| 14 | Pacific Gas & Electric* | 0.56% |
| 15 | Georgia Power | 0.56% |
| 16 | Madison Gas & Electric | 0.55% |
| 17 | Public Service Electric & Gas | 0.53% |
| 18 | Puget Sound Power & Light | 0.53% |
| 19 | Mississippi Power | 0.51% |
| 20 | Philadelphia Electric | 0.50% |

*Utilities on both charts. Source: The TECC Guide to U.S. Electric Utility RD & D Funding 1986-1987.

# Yankees vote 'yes,' again for Maine's nuclear plant

WISCASSET, ME—Voters said "yes" to the Maine Yankee nuclear power plant, by a 59- to 41-percent margin. For the third time in seven years anti-nuclear forces failed to close the plant.

Previous votes failed 60 percent to 40 percent in Sept. 1980 and 55 percent to 45 percent in November 1982, as reported in November's *EL&P*.

"I figured it was going to be closer than it was," said Alva Morrison, spokesman for Maine Nuclear Referendum Committee, the group against the plant. The campaign claimed that closing the plant would decrease the chances of a nuclear waste dump being located in the state.

Morrison said, in defeat, that the pro-nuclear forces ran an extremely well-organized and well-funded campaign.

Morrison pointed out that his group raised and spent about $550,000, while pro-nuclear forces reported spending more than $5 million.

"We could have spent about half that amount if we had a straightforward question," said Bob Deis of Vote Yes on One: People for Maine Yankee's Electricity committee.

Deis said the referendum question was confusing because, in the two previous referenda, a "no" vote would have kept the plant operating.

As a result of the confusion, Deis explained, the legislature passed a law requiring that referenda be worded in the traditional manner.

Deis said that although his group did outspend the opposition, Maine people have voted down other highly paid campaigns.

Through an extensive telephone campaign, the pro-nuclear forces were thought to have gotten a larger percentage of their supporters to the polls than the opposition.

Maine Yankee won because of widespread, grass-roots support, Deis claimed. His group emphasized that replacement power would cost much more than electricity from Maine Yankee, that fossil-fueled electricity would negatively affect the environment and that jobs would be lost if the plant closed. Maine Yankee power was named the nuclear industry's cheapest in 1986 by Utility Data Institute Inc.

Deis suggested the Maine vote may not translate into a rubber stamp for other nuclear plant referenda next year in Massachusetts and California.

However achievements like Maine Yankee's achievements could be a plus in other referenda. "If we have safe, reliable, economic nuclear power, the public will support it. Maine Yankee is a national leader. The nuclear industry should keep that in mind," he said.

Maine Yankee won a referendum that would have closed the 15-year old plant after July 4, 1988.

# NRC 'okays' restart of Oyster Creek

PARSIPPANY, NJ—The Nuclear Regulatory Commission recently said General Public Utilities could restart the Oyster Creek nuclear plant. The plant was down since a mid-September safety violation during a shutdown.

GPU Nuclear Inc. said it planned operation by the time this edition of *EL&P* is published, following additional maintenance work.

The plant's troubles began on September 11, during a scheduled shutdown. A worker was sprayed with slightly contaminated water. (He washed and was not injured.) In an effort to stop the leak, the wrong valve was closed briefly, which reduced to one the number of generator cooling lines available. This control error resulted in the violation, a GPU spokesman said.

Because the reactor was shut down at the time, the NRC later assessed the risk as small.

The NRC required that plant operators on duty during the incident be assigned to other areas. GPU discovered that some data on the incident was apparently destroyed. An investigative team is looking into the matter, the spokesman said.

# Editorial

## Big changes still lie ahead as we look toward the New Year

Back in the late '60s and early '70s, Bob Dylan told the world "The times, they are a-changing." That song, which was very big with my two young daughters then, described what was happening in our society. It might be sung now about the conservative, unchanging electric utility industry we know so well.

In recent months, we've heard and read about all those changes that are due to come in the near future...perhaps even next year. But as the New York pitchman says, "Friends, you ain't seen nothin' yet!" Here are some of the developments underway or on the horizon.

*Formation of one-utility holding companies* is a well-developed trend. Most investor-owned electric companies have decided that a holding company offers real growth potential during this period of low growth in electrical demand and strict oversight by regulatory commissions. Perhaps they've been watching the banking industry, which moved this way a decade ago.

*Diversification*, that seventy-five cent word that means get into some businesses the state commission can't control, is so widespread that it's the rare electric utility that isn't involved. But many of the diversifications are small and contribute little to the parent. Still incurring learning-curve problems, many diversification efforts remain in the red. But potential profits are there and the range of unregulated businesses utilities are pursuing continues to increase.

*Restructuring*, with Gencos, transcos and discos, is getting more serious discussion. Several companies have "sold" generating facilities to their own non-regulated subsidiaries and have reduced costs but these remain unusual situations. There's still no real action trend in this direction.

*Reduced reliance on central station power.* Electric utilities historically have been the primary supplier of bulk power for their customers. But independent producers, cogenerators and Canadian provincial power organizations now offer the prospect of increasing the bulk power supply without capital investment. Since much of this new added capacity will be non-regulated and directly competitive, utilities may be able to develop especially favorable contracts based on low-price offerings. But reliability and long-term availability remain unknowns. Neighboring utilities with current surpluses of capacity may offer a temporary solution, but probably only in the short-term..

*Marketing* once was the biggest challenge before utilities. Most utilities could "make it easier than they could sell it." So they developed marketing programs and worked them hard. Solid, steady growth followed. Then came the Energy Crisis of 1975-1981 and extensive subsequent conservation efforts that put marketing at the bottom of the list of utility priorities. Growth slowed and financial problems abounded. Now, marketing is back, with a broader goal than before. The goal is not just higher kWh sales, but rather increasing kWh sales where electricity can perform its function better than other energy forms, and reducing them where other energy forms are more competitive.

*Market-based rates and cost-based rates* may become more common. Market-based rates refer to rates that are set to be competitive with energy costs from other suppliers or from cogeneration arrangements. Cost-based rates are those established for types of customers, based on the real costs of service to those groups. In both cases, the result can be reduced revenues for the electric utility involved, higher rates for some customer groups, or a combination.

*Changing patterns of regulation* are a growing source of concern to many utility managements. As more and more independent producers, cogenerators and other non-regulated sources of bulk electricity are incorporated into utilities's plans, there is a corresponding increase in regulation focused on the distribution or retail-end of utilities' operations.

How these various developments will affect any individual utility depend on a variety of factors, including location, type of organization and its productivity, financial strength, nature of load, and the regulatory environment, among others. The one thing that seems certain is that many of the electric utility organizations we know today will be substantially different in a year or two.

The degree to which any given utility will be affected, and the direction of change, will depend largely on the skills of its management in anticipating the kinds of pressures and changing environments that may develop, and on its abilities to implement plans to the greatest advantage of the utility.

As we move into 1988, the challenges have never been greater. The corollary to that is that the opportunities never have been brighter, either.

*Robert A. Lincicome, Editor-in-Chief*

# Letters

**PCB testing controversy**

In December 1986 *EL&P* published an account showing a comparison between gas chromatograph/electric capture detector and gas chromatograph/mass spectrograph for analyzing PCB. This was followed by a series of letters in the March and April issues.

The work in the following report was done to resolve the issue. We believe it has done that. We would appreciate publication.

*Gil Addis*
*Project Manager*
*Electric Power Research Institute*
*Palo Alto, CA*

### Chromatographic Analysis of PCBs in Transformer Oils

### A Mini-Round Robin

G. Addis, EPRI & T. Rouse, GE

An article appeared in *Electric Light & Power* magazine in December 1986, reporting that capillary Column Chromatography/Mass Spectrocscopy (CC/MS) for analysis of PCBs in transformer oils was more accurate than Packed Column Gas Chromatography/Electron Capture Detector (PC/ECD) and Capillary Column/Electron Capture Detector (CC/ECD). It was said that these commonly relied upon ECD techneiques had a tendency to give false high readings. It is shown in this paper that, when properly done, all three techniques give comparable results.

The work was initiated because a number of people and organizations expressed concern over the published claim of systematically incorrect PCB analyses. Included among these were electric utility managers, the United States Environmental Protection Agency, members of ASTM committee D27, who contributed to the development of ASTM Standard Method D4059 (Analysis of Polychlorinated Biphenyls in Insulating Liquids by Gas Chromatography), and Doble Engineering Company. It was suggested that EPRI investigate the matter. EPRI then contracted with General Electric in Pittsfield, MA, to investigate the relationship between the three methods.

General Electric arranged with three nationally known laboratories to run a series of tests. The participants were:

Midwest Research Institute—Rob Scuderi

Radiaan Corporation—Maureen Kilpatrick and Alan Nichols

Twin City Testing—Fred DeRoos

Four samples were obtained and aliquots sent to each laboratory. Each laboratory was requested to analyze the samples by three methods:

PC/ECD—Packed Column/Electron Capture Detector

CC/ECD—Capillary Column/Electroc Capture Detector

CC/MS—Capillary Column/Mass Spectrometer

The samples were as follows:

A— 430 µg/g Aroclor 1254* in aged oil

B—1110 µg/g Aroclor 1242* in new oil

C—2350 µg/g Aroclor 1254* in aged oil

D—4170 µg/g Aroclor 1242* in aged oil

* = Average of all results from three labs and three methods

For comparison of laboratories and methods, the results were normalized so that 1.00 represented the average (for all laboratories and all methods) on each sample. The average values and standard deviation are shown below:

**Normalized Results-PCB Analysis**
Averaged By Method

| *Method* | *All Samples* | *Value* |
|---|---|---|
| PC/ECD | Average | 0.97 |
| | Std. Dev. | 0.09 |
| CC/ECD | Average | 1.08 |
| | Std. Dev. | 0.07 |
| CC/MS | Average | 1.00 |
| | Std. Dev. | 0.19 |
| All Mtds. | Average | 1.00 |
| | Std. Dev. | 0.13 |

**Normalized Results-PCB Analysis**
Averaged By Laboratory

| *Laboratory* | *All Samples* | *Value* |
|---|---|---|
| W | Average | 0.96 |
| | Std. Dev. | 0.14 |
| Y | Average | 1.11 |
| | Std. Dev. | 0.16 |
| Z | Average | 0.93 |
| | Std. Dev. | 0.11 |
| All labs | Average | 1.00 |
| | Std. Dev. | 0.13 |

Finally, the following observations were made:

○ Results from Lab Y are somewhat higher than the other two.

○ Results from Method CC/ECD are somewhat higher than the other two.

○ Results from Method CC/MS are somewhat more variable.

○ Differences between methods and labs are less than 20 percent.

We concluded that the ECD techniques show no significant systematic difference from MS when proper procedures are used for each, and therefore, the ECD methods do not result in falsely high values.

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JANUARY 1988

ELECTRIC LIGHT & POWER

EL&P

Volume 66, Number 1
A PENNWELL PUBLICATION

VOICE OF THE ELECTRIC UTILITY INDUSTRY

## LATE NEWS

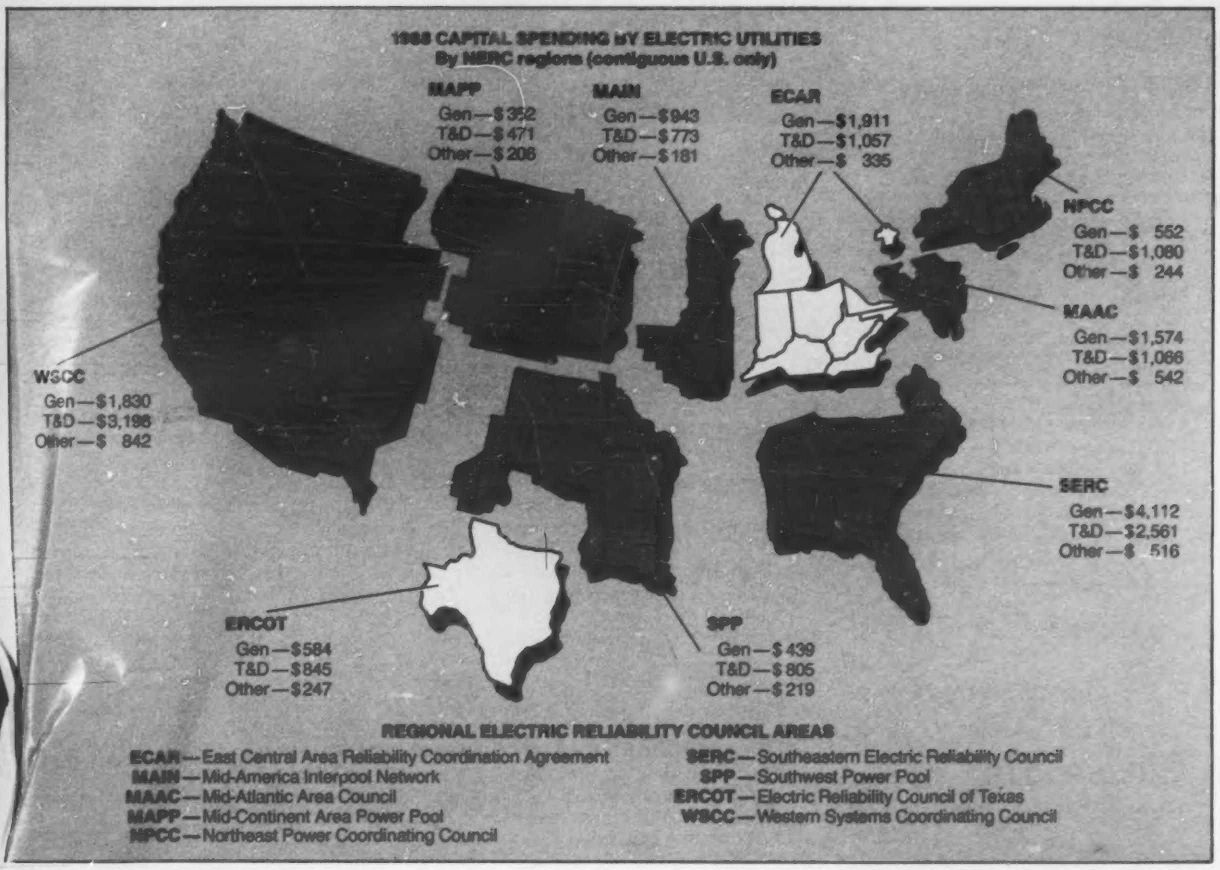
**Palo Verde Nuclear Generating Station** dedication by DOE Secretary John S. Herrington marked completion of the 3810-MW facility. Unit 3 goes commercial this month. See the related report, page 24.

**Nine Vermont utilities** and Hydro-Quebec agreed to a 30-year, $5.5-billion contract for up to 500 MW, starting as early as 1990. Cash savings could total 30 percent over the next-best choice, a combined-cycle plant.

**PS of New Hampshire** proposed a revised financial restructuring that would give unsecured debt holders a controlling interest, wipe out a substantial amount of debt, but dilute interests of current common stockholders. A trustee for certain debtholders earlier filed suit seeking to attach property because of PSNH defaults on interest payments. See story this issue.

**The Federal Energy Regulatory Commission** has the power to allocate the costs of the Grand Gulf 1 nuclear plant among four Middle South utilities that own it, a Supreme Court decision to let stand a federal appeals court ruling says.

# $27.5-billion of new plant to be built in '88


1988 CAPITAL SPENDING BY ELECTRIC UTILITIES
By NERC regions (contiguous U.S. only)
MAPP
Gen—$ 352
T&D—$ 471
Other—$ 208
MAIN
Gen—$943
T&D—$773
Other—$181
ECAR
Gen—$1,911
T&D—$1,057
Other—$ 335
NPCC
Gen—$ 552
T&D—$1,080
Other—$ 244
MAAC
Gen—$1,574
T&D—$1,066
Other—$ 542
WSCC
Gen—$1,830
T&D—$3,198
Other—$ 842
SERC
Gen—$4,112
T&D—$2,561
Other—$ 516
ERCOT
Gen—$584
T&D—$845
Other—$247
SPP
Gen—$ 439
T&D—$ 805
Other—$ 219
REGIONAL ELECTRIC RELIABILITY COUNCIL AREAS
ECAR—East Central Area Reliability Coordination Agreement
MAIN—Mid-America Interpool Network
MAAC—Mid-Atlantic Area Council
MAPP—Mid-Continent Area Power Pool
NPCC—Northeast Power Coordinating Council
SERC—Southeastern Electric Reliability Council
SPP—Southwest Power Pool
ERCOT—Electric Reliability Council of Texas
WSCC—Western Systems Coordinating Council

BARRINGTON, IL—U.S. electric utility organizations will invest almost $27.5-billion for new facilities in 1988. This is one of the findings from EL&P's latest survey of electric utility capital investment plans, which was completed in late November.

This amount reflects an increase of $487-million, or 1.9 percent, from 1988 plans reported a year ago. But the total is 3.9 percent, or $1.1-billion, below last year's capital spending projections.

Projected capital spending for generation facilities in 1988 shows a decline of $751-million, while "Other" spending will fall $813-million.

T&D spending will increase in 1988 to $11.9-billion, from $11.5-billion in 1987. Substation spending, which tends to be understated because many reporting utilities include those programs in transmission and/or distribution plans rather than separately, appears to be about the same as in 1987, while transmission spending is projected to fall by $322-million. But distribution spending will increase by more than $780-million, reflecting the strength of the construction business.

Overall, generation spending will be almost 45 percent of total capital spending in 1988. While total generation spending in 1988 will be down, its share will increase from projections of 1988 spending made a year ago.

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**See the full capital spending survey report beginning on page 11.**

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## *SMUD voters would not open plant: Duke Power poll*

SACRAMENTO—A Duke Power Co. poll showed that most residents in the Sacramento Muncipal Utility District oppose reopening the troubled Rancho Seco nuclear power plant.

Duke officials have indicated that they may be interested in purchasing or operating the plant as one possible agreement they could strike with SMUD.

Pacific Gas & Electric has proposed buying the entire district for an undisclosed amount, but said it would close Rancho Seco, which represents about half the district's generating power. At SMUD's request, area utilities have quoted prices for supplying long-term replacement power.

Rancho Seco, closed since a 1985 emergency shutdown, is to restart late in January, begin power pro-

Continued on page 6

## Three Zimmer utilities settle, write off GE suit

In a complex financial settlement, three utilities expect to take write-offs totalling $220 million after settling a lawsuit against General Electric Co. and Sargent & Lundy Engineers.

The utilities already suffered more than $321 million in related write-offs in 1985.

In the lawsuit, the utilities sought to recover damages from GE for increased costs at the William H. Zimmer generating station because of design and construction modifications in the reactor containment system. Zimmer, located in Moscow, OH, is now being converted from a nuclear plant to a coal-fired plant.

After a summary trial and negotiations, GE agreed to pay $78.3 million to the utilities in return for two unused non-nuclear turbines purchased in 1979 and 1980. The turbines are carried on the utilities' books at $41 million. GE and the utilities will sell other unneeded material and equipment from the site and halve the proceeds

Separately, Sargent & Lundy paid the utilities $27.7 million.

As a result of the settlement:

□ The Cincinnati Gas & Electric Co. expects to take a $91-million write-off after-taxes against 1987 earnings.

That amount is in addition to $142 million that CG&E wrote off in late 1985, resulting from a Ohio Public Utilities Commission ruling which disallowed the inclusion of $861 million ($400 million CG&E's share) of

Continued on page 7

# News Briefs

**JILL MINNER, Assistant Editor**

## NRC grants full power license to Palo Verde Unit 3

● The Nuclear Regulatory Commission Office of Nuclear Reactor Regulation has issued a full power operating license to Arizona Public Service Company for Unit 3 of its Palo Verde nuclear generating station. Unit 3, located west of Phoenix, is the third unit licensed of the three-unit station.

## Middle South Utilities signs agreement with NAACP

● Middle South Utilities, Inc. (MSU) recently became the first electric holding company in the nation to sign a Fair Share Agreement with The National Association for the Advancement of Colored People (NAACP), the association said. "Middle South Utilities evidenced admirable good faith by approaching the NAACP about signing a Fair Share Agreement, instead of it being the other way around," stated NAACP Executive Director Benjamin L. Hooks. "We have rarely worked with a company that has evidenced such a positive attitude in helping to assure increased economic and employment opportunities for minorities," Hooks added. MSU Chairman and President Edwin Lupberger said, "the company has a number of minority programs in place, and is planning others." MSU's operating subsidiaries—Arkansas Power and Light, Louisiana Power and Light, Mississippi Power and Light, and New Orleans Public Service, Inc.—had previously signed Fair Share Agreements with the NAACP.

## NEPOOL, Hydro-Quebec sign short-term power agreement

● The New England Power Pool (NEPOOL) has signed a short-term contract with Hydro-Quebec for the purchase of 500 MW of electricity. NEPOOL Executive Director Phillip C. Otness said the contract will improve New England's power supply during the winter months and will provide additional energy during peak demand periods. Otness added that the agreement, "...is based on Hydro-Quebec's thermal resources which can be delivered to New England even when Quebec is experiencing record winter demand in its own region."

## DOE responds to recommendations in NAS/NAE safety report

● The National Academies of Sciences and Engineering have released a report on safety issues at the Department of Energy's (DOE) production reactors, which contains a number of safety recommendations. In response to the recommendations, DOE said its plans include: establishing an external oversight committee for nuclear safety; the Assistant Secretary for Environment, Safety and Health (ES&H) will prepare and coordinate a plan to improve DOE's independent safety oversight function; the Assistant Secretary for ES&H will develop and coordinate a plan for revising the DOE order system and safety standards; DOE will sign a Memorandum of Agreement with the Institute of Nuclear Power Operations; the Assistant Secretary for Defense Programs will prepare an action plan for resolution of each technical recommendation in the NAS report. Energy Secretary John S. Herrington, who requested that the academies prepare the report, said, "The report is impressive and constructive....The challenge now is to get the fullest possible benefit from this report."

## Asea Brown Boveri names president, CEO for U.S. operations

● Klaus E. Agthe has been appointed president and chief executive officer of U.S. operations for Asea Brown Boveri. The newly formed company is the result of a merger between Asea AB in Sweden and BBC Brown Boveri in Switzerland. Agthe was formerly president and CEO of BBC Brown Boveri USA.

## In This Issue

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**Letters** ........ 4
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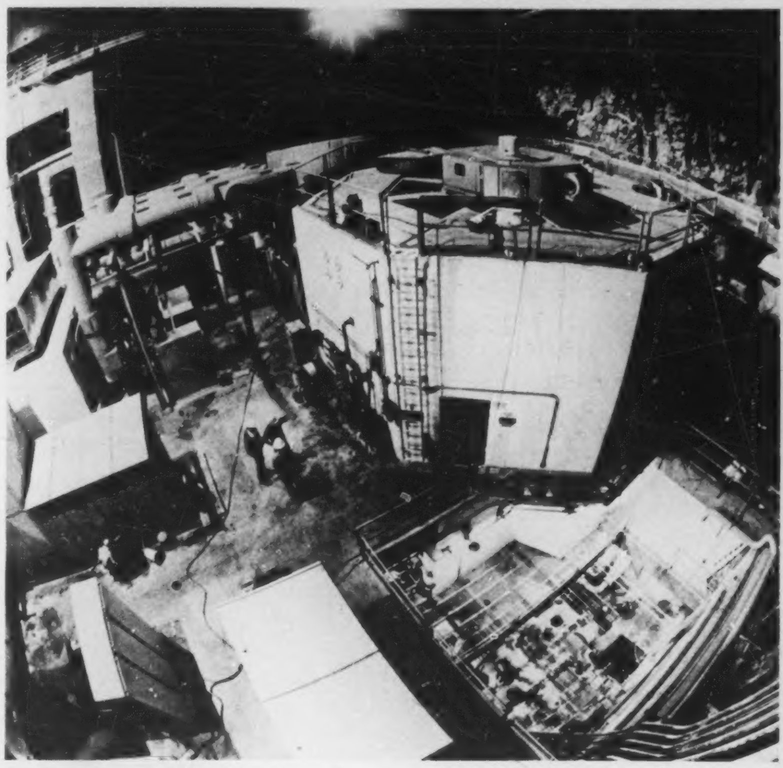
EL&P readers whose responsibilities include both Generation and Transmission/Distribution receive both technology sections. Other readers receive the technology section that applies to their respective area of responsibility. The Generation edition is indicated by a single dot (•) in the upper right corner of page 1; the T/D edition carries two dots (••). All readers receive EL&P's industry news section.

## SoCalEd's Balsam Meadow Hydro Project begins operating



● Southern California Edison Company (SCE) said its Balsam Meadow Hydroelectric Project, located in the John S. Eastwood Power Station, officially went 'on-line' December 1. According to SCE, the 200-MW turbine is anchored in a cavern carved from solid granite 1000 feet below the Sierra Nevada Mountains northeast of Fresno, CA.

## Westinghouse finds FFTF useful in fight against osteoporosis

● According to Westinghouse Hanford Company, a radioactive element produced at its Fast Flux Test Facility (FFTF) is now being distributed internationally for use in fighting osteoporosis, a crippling bone disease. The element is used as the irradiation source in an advanced bone-scanning machine which helps doctors detect the onset of osteoporosis and monitor treatment effectiveness, explained Robert Schenter, lead scientist for the company's isotope production program. "This is the first time that FFTF isotopes have been sold for medical purposes, and we plan to continue," Schenter commented. The FFTF, a multipurpose test reactor for advanced nuclear fuels and materials development, is operated by Westinghouse Hanford for the Department of Energy.

## PES establishes award to honor outstanding young engineer

● The Power Engineering Society (PES) announced that it has established the Walter Fee Outstanding Young Engineer Award. According to PES, the award is for outstanding contributions in the leadership of technical society activities including local and/or transnational PES and other technical societies; leadership in community and humanitarian activities; and evidence of technical competence through significant engineering achievements. Eligible nominees must be 35 years-old or under on January 1 of the presentation year and have been a member of PES for at least one year. The deadline for nominations is March 15, 1988. For more information contact: Dr. B. Don Russell, Chairman, Walter Fee Outstanding Young Engineer Award Committee, Dept. of Electrical Engineering, Texas A&M University, College Station, TX, 77843-3128 or call (409) 845-1423.

## DOE picks firms to develop coal-burning diesel engines

● Two industrial teams have been selected by the Department of Energy to develop an advanced diesel engine for commercial use. DOE said the government-financed project could help return coal to major transportation and industrial power markets. Each of the two teams, headed by Arthur D. Little, Inc. and GE Transportation Systems, has proposed to fund up to 20 percent of its project's cost, according to DOE.

## Atlantic Electric thanks customers for helping with campaign

● Atlantic Electric said it has ended the 'Power On' campaign that it began last spring when an oil tanker crashed into a transmission tower, knocking out a 500,000-volt power line. The campaign, designed to ensure reliable electric service during repair of the damage, called for utility customers to curtail energy usage during peak demand periods. "Our message now is a heartfelt thanks to our customers," said Atlantic Electric President and CEO E. Douglas Huggard, "Their cooperation and willingness to observe sound energy use practices this summer—especially on those uncomfortable days, when we made our most urgent appeals for conservation—helped us to avert any serious problems."

# Editorial

## A look back and a look ahead

The final days of 1987 are winding down as this editorial is being written. Usually this column is devoted to commentary about developments in the industry that can affect you, our readers. But this month I'd like to use this space to discuss developments at *Electric Light & Power*, to take time to stop for a moment, to pause and take stock of where we've been and where we're going.

1987 has been a great year for *EL&P*, and I'd like to share some of the sense of achievement, growth and excitement that we've experienced. I also want to share with you, our readers, an idea of some of the new things we're planning for the year ahead.

We began 1987 by being welcomed into the PennWell Publishing Company family. PennWell, as some of our readers already are aware, publishes *Oil & Gas Journal* and a number of other publications in the high technology and dental fields, and has built a strong reputation for editorial integrity and excellence, and almost immediately we began to sense the different environment. Pressures and limitations that curtailed some activities formerly were lifted. As editors, we've been encouraged to broaden our coverage of industry developments, to seek new ways to serve our readers. The relationship with the PennWell management has strengthened through the year as we have gotten to know each other better. It's been a great experience.

In April we moved to our new quarters at 1250 S. Grove in Barrington, where we share brand-new facilities with our sister publication, *Power Engineering*. The new building is only across the street from our former offices, but it's a world away in terms of working atmosphere.

During the late Spring, Hank Stein joined the *EL&P* editorial team as engineering editor, bringing to the publication a new perspective on technological development and increasing our capacity to serve readers' needs for technical information. Then in the early Fall, we brought Mark Hoske onto the staff to bolster news coverage.

In 1987, we brought you our four regular Special Reports, then added 22 Technology Focus reports that covered technical subjects ranging from fuels and fuel handling to and through the power plant and out to customers' meters, from SCADA system to training to water treatment to instrumentation and controls. This represents the largest output of special *EL&P* editorial materials in more than a decade.

As a result of this broad editorial menu provided during the year and your consistant desire for more, better information about developments in and around the electric utility industry, you again made *EL&P* the best-read of all publication serving the electric utility industry. This readership subsequently was converted to increased advertising sales, producing added revenues to pay for production of the publication. That we finished 1987 ahead in sales of advertising, revenues and earnings, is a direct reflection of your loyalty and readership.

Yes, 1987 was quite a year for me and for the whole staff. But if you liked what you received in 1987, just wait for '88 to unfold. Like Al Jolson used to say, "You ain't seen nothin' yet!"

This issue reflects the first step in our redesign to better reflect the increasing excitement and dynamism of the industry. In March, you will see new formats throughout, with new typefaces that will make *EL&P* even easier to read. We're also adding several new departments to help you stay abreast of industry developments in subject areas we covered only peripherally before. We're adding reporters in several parts of the country to increase coverage and we plan to add to our technical staff to improve the quality of the engineering articles and reports we will bring you.

Of course, we'll still publish our four regular Special Reports—the forecast in this issue, the two Top 100 Electric Utilities reports (June and August) and the November Electric Utility of the Year report—and 14 Technology Focus reports. Several other special features are in the works, too.

1988 promises to be even more exciting, challenging and fulfilling than 1987.

As we look to the New Year, our hope for all of you is that your lives will be as challenging and satisfying as ours. From all of us at *EL&P*...Art, Barry, Bill, Carl, Dave, Dianne, George, Hank, Jean, Jill, Larry, Margaret, Mark, Roberta, Roger and Ted—from the whole publishing, editorial, marketing, circulation and production team—may your 1988 be healthy, happy and rewarding... the very best ever.

*Robert A. Lincicome, Editor-in-Chief*

# Letters

### 1940's work schedules

This letter concerns your article in the August 1987 edition of *Electric Light & Power*, "1940's schedules don't fit today's plant needs," (p.24). Additional information concerning specific models of integrated five-crew eight-hour schedules and 12-hour slowly rotating schedules for a 40-hour work week would be appreciated.

*John M. Smith Director,*
*Energy Control Center*
*Alabama Electric Cooperative*, Inc.
*Andalusia, AL*

*In response to your letter, and others, we have requested that Dr. Coleman provide several examples of how alternative crew shift-work schedules might look. These will be published in a future issue of* EL&P *as soon as possible.*

### LTC evaluation methods

Having read your article titled "Evaluation method can ease LTC selections" (October *EL&P*, p. 30), it amazes me that the Editor-in-Chief of a well-respected utility magazine would accept an analysis from a representative of one manufacturer as gospel.

To believe a representative can make an accurate analysis on such a complex issue as the merits of load tap changers, is unbelievable.

H.K. Porter Company, Inc., having used the Siemens, ASEA, Westinghouse and Rhinehousen tap changers have design parameters on these units that indicate that none of these on load oil arcing tap changers will handle 500,000 operation(s) at their maximum current rating.

The following questions should be asked.

1. Can the ASEA tap changer contact life handle 500,000 operation(s) at 600 amps [Emphasis provided]?
2. Did Siemens ever make a TL3 tap changer?
3. Does anyone in the utility industry do a bi-annual inspection on LTCs?

When answers are obtained for the above questions, it will be clearly seen that there were some inaccuracies in the analysis.

H.K. Porter Company, Inc. is requesting a copy of Mr. Jerry Norcia's analysis and are prepared to generate a more accurate analysis if you would print it.

*C.N. Pany, General Manager*
*H.K. Porter Company, Inc.*
*Electrical Division*
*Belmont, CA*

*We found Mr. Norcia's approach provocative, although not altogether unbiased. Moreover, we did not accept the approach as 'gospel, but rather as an interesting attempt to simplify a complex process. We always are open to technical responses and will look forward to Mr. Pany's analysis.*

## SoCalEd to test GM electric van

ROSEMEAD, CA—Southern California Edison is to receive demonstration models of a General Motors Corp. electric van this month. GM said it will begin production-line manufacturing of the one-ton van by the end of this year.

### Clean fuel

"Electricity is a clean fuel and ideally suited for mobile-source pollution control," said Michael Hertel, manager of SCE's environmental affairs division.

"If only five percent of the vehicles in the South Coast air basin were electric, we could reduce daily reactive organic gases (ROG) and oxides of nitrogen (NOx) emissions significantly."

### Night recharging

In addition, wide-spread use of electric vehicles would help utilities' sale of off-peak power by recharging primarily at night.

About 10 million vehicles now pollute the area—electric vehicles are considered 98 percent less polluting, SCE cited.

### Overnight recharge

The van has a range of 60 miles per battery charge with a top speed of 52 miles per hour. Braking helps charge the battery. The van recharges overnight, but can gain a 30-percent charge in two hours.

"Market research indicates that there are at least 10,000 vans in large fleets in the Los Angeles area today that travel less than 60 miles a day," Hertel claimed.

Chrysler is also planning to produce an electric van within two years with a higher maximum speed and longer range, Hertel added.

Others involved in the project are Electric Power Research Institute, the Electric Vehicle Development Corp., the Department of Energy, Tennessee Valley Authority and other independent reseachers. EPRI and TVA operate a vehicle testing center.

Electric Light & Power

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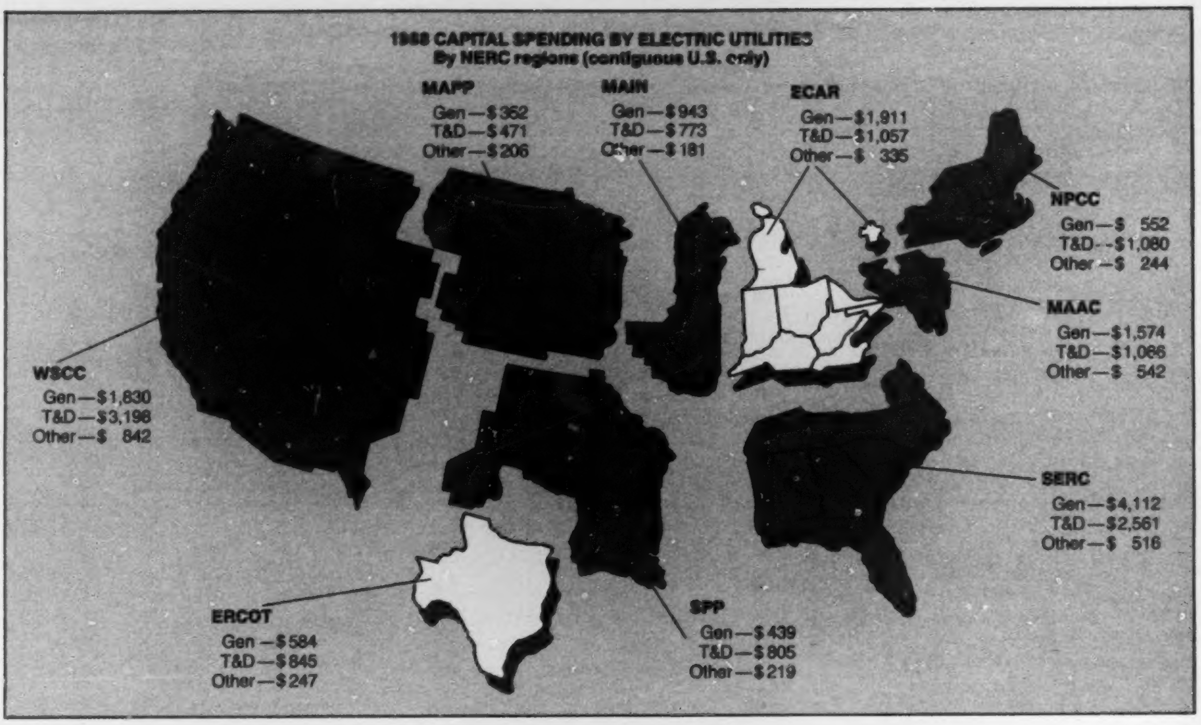
# Electric utilities will increase spending plans through 1992

## Generation system investment still continues decline

Robert A. Lincicome
Editor-in-Chief



The nation's electric utility organizations are stepping up capital investment programs for new and improved facilities slightly in the 5-year period ending with 1992. This is a primary conclusion from *EL&P's* 1988 Capital Spending survey, which was completed late last November.

Survey results, which include investor-owned companies, cooperatives and public power organizations, are projected to reflect spending plans for the entire electric utility industry.

Overall, utilities will spend almost $122-billion during the 5-year 1988-1992 period. Generation will continue to be the largest single functional area of activity, but represents a declining minority of total capital spending. Combined transmission and distribution spending will total less than generation spending in 1988, but by 1990 will exceed generation spending. Spending for other catagories of activity remains fairly constant at about 12.5 percent of total spending throughout the period.

The study also indicated that pattern of utility capital spending continues to follow the movement of people and businesses. Largest capital investment will be in the areas of greatest growth, namely the Southeast and far West.

### Patterns of spending

Funds devoted to generation, as shown in the table on this page, will decline from 44.7 percent of total capital spending in 1988 to a low of 35.2 percent in 1991, before turning upward to 37.7 percent in 1992. T&D spending will rise from 43.3 percent in 1988 to a high of 51.7 percent in 1991, declining to 50.5 percent in 1992.

Other capital spending, as noted earlier, runs between 11.8 percent and 13.1 percent, averaging about 12.5 percent.

### Generation expansion plans

The study showed that the majority of utilities are not planning to add substantial amounts of capacity until the mid-1990s or later. Most capacity to be added prior to the mid-1990s will be small, nominally in the 50- to 100-MW range, which means a new influx of combustion turbines, albeit that some may be used in combined-cycle arrangements with existing steam units.

After 1995, a number of mid-size units, in the 300- to 600-MW range, currently are planned. Only a handful of large units, rated above 600 MW, are slated to be built, mostly near or after the turn of the century.

### Life extension no trend

With current capacity reserve levels in some question, and with little new capacity planned for the short- to mid-term, it seemed logical to suppose that there would be considerable interest and action to extending the lives of existing generating units. The survey showed that to be an erroneous assumption.

Overall, about 30 percent of reporting electric utilities say they currently are involved in any life extension work. And about half of the utilities that say they are involved in extending the lives of their generating units report they still are in the study or evaluation stage.

One problem with the responses to the question on life extension may result from terminology. Conversations subsequent to mailout of the survey indicated that some utility executives consider plant upgrading to be separate from life extension. In addition, some life extension work may be covered under "maintenance," and not as a capital project. This confusion could account for the slight decline in life extension programs from a year ago.

As might be expected, the majority of active life extension projects are being conducted east of the Mississippi, where so many older plants are located.

### 1988 spending raised

For 1988, capital spending for new facilities will total $27.5 billion. Although this represents a $1.1-billion decrease from 1987 capital spending projections made a year ago, it reflects a $487-million increase, or 1.8 percent, from the level for 1988 projected a year ago.

The majority of the decrease from 1987 projections is generation spending, which will be down some $750-million in 1988 from the projected level in 1987. Actual 1987 spending levels won't be available for some time.

Generation spending in 1988 is projected to be $12.3-billion, down 5.8 percent from 1987 estimates.

The bulk of generation spending will be devoted to projects currently in progress and to some short-term small-capacity increases in peaking power capacity.

Spending for power delivery systems—substations, transmission and distribution facilities—will total $11.9-billion. The brightest spot in this area is distribution, which should increase to almost $8-billion from about $7.2-billion in 1987. Spending for substation construction is projected to drop about $20-million from the 1987 level, to $1.37-billion and transmission, at $2.6-billion, will be down about $322-million.

Readers should note that substation spending figures are generally understated because a number of utilities do not segregate substation

Continued on page 12

| NORTH AMERICAN ELECTRIC RELIABILITY COUNCILS | |
|---|---|
| ECAR | East Central Area Reliability Coordination Area |
| ERCOT | Electric Reliability Council of Texas |
| MAAC | Mid-Atlantic Area Council |
| MAIN | Mid-America Interpool Network |
| MAPP | Mid-Continent Area Power Pool |
| NPCC | Northeast Power Coordinating Council |
| SERC | Southeastern Electric Reliability Council |
| SPP | Southwest Power Pool |
| WSCC | Western Systems Coordinating Council |

**1988 CAPITAL SPENDING BY NERC REGION**
**(Contiguous U.S. only—In $ millions)**

| Region | Generation | Substation | Transmission | Distribution | Other | Total |
|---|---|---|---|---|---|---|
| ECAR | 1,911 | 69 | 254 | 734 | 335 | 3,303 |
| ERCOT | 584 | 100 | 309 | 436 | 247 | 1,676 |
| MAAC | 1,574 | 105 | 168 | 806 | 529 | 3,182 |
| MAIN | 943 | 65 | 122 | 587 | 180 | 1,897 |
| MAPP | 352 | 33 | 144 | 309 | 191 | 1,029 |
| NPCC | 552 | 200 | 153 | 732 | 239 | 1,876 |
| SERC | 4,112 | 231 | 627 | 1,708 | 511 | 7,189 |
| SPP | 438 | 94 | 190 | 524 | 217 | 1,463 |
| WSCC | 1,830 | 474 | 591 | 2,143 | 832 | 5,870 |
| **Total** | **12,296** | **1,371** | **2,558** | **7,979** | **3,281** | **27,485** |

**CHANGING PATTERNS OF INVESTMENT**
**1988-1992**

| | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|
| Generation | 44.7% | 43.7% | 39.2% | 35.2% | 37.7% |
| T&D | 43.4% | 43.7% | 47.9% | 51.7% | 50.5% |
| Other | 11.9% | 12.6% | 12.9% | 13.1% | 11.8% |
| Total | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

# Spending plans. . .from page 11

spending, including substation project costs in investment for transmission, distribution or both.

At the same time, projections for transmission and distribution may be overstated by virtue of substation projects lumped into overall T&D investments.

### 5-year improvement noted

The relative increase in capital investment plans can best be seen by comparing spending plans for the four years common to both the 1987 and 1988 surveys, namely the years 1988-1991.

A year ago, projections of capital investment plans for the period 1988-1991 totalled $96.3-billion. This year's study indicates investment of $99.5-billion for the same period. This represents a net increase in spending of 3.3 percent for the four years, or an average of about $800-million per year.

As expected, the current survey continues to reflect the current overcapacity situation in generation facilities and the reluctance of utility managements to commit to plans for new capacity. This remains true despite the fact that last year's heat storms left a number of utilities near or below safe reserve margin levels, and some utilities actually ended up having to reduce voltages and curtail some load during summer peak demand periods.

At the same time, spending for substations, transmission and distribution facilities remains at a high level, slightly above projections a year ago.

While there continue to be discussions about the need to strengthen both intra- and inter-pool transmission links, there is no apparent strong effort developing during the period. There will be, however, some continuing transmission and substation upgrading efforts in the absence of the need to build new transmission facilities to serve new generating plants.

### Other spending

Capital spending in the "Other" category continues at a high level, averaging about $3-billion per year through the 5-year period. A year ago, projections indicated a spending level of 14.5 percent, or $3.7-billion per year. Although the current projection reflects a decrease, "Other" spending still is running substantially above the 4- to 5.5-pecent level that was typical throughout the previous decade.

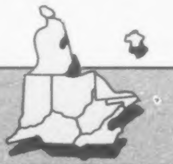
"Other" capital investment in past years has largely been devoted to headquarters and other office and service buildings, certain capitalized fuel resources and the like. Now, however, spending in this category also includes utility investments in facilities and resources involved in broadened diversification programs.

### Projected spending by regions

In the next five years, areas of largest capital investment growth will follow population and business growth trends. For the period, the greatest activity will occur in the SERC area, with the WSCC region slipping. This represents a substantial change from projections made a year ago, reflecting a $9-billion reduction in spending in the West and a $5.6-billion increase in the Southeast.

Figures for regional spending in the following text are expressed in millions of dollars.

**ECAR**



| | Gen | T&D | Other |
|---|---|---|---|
| 1988 | 1,911 | 1,057 | 335 |
| 1989 | 1,876 | 1,022 | 306 |
| 1990 | 1,358 | 1,074 | 324 |
| 1991 | 1,116 | 1,083 | 261 |
| 1992 | 761 | 1,005 | 256 |
| Total | 7,022 | 5,241 | 1,482 |

Utilities in the East Central Reliability Coordination area will spend $13.7-billion for system expansion in the years through 1992. During the period, generation spending will decline steadily, from $1.9-billion in 1988 to $761-million in 1992. Transmission and distribution spending will average around $1.0-billion per year through the period.

**PROJECTED 5-YEAR CAPITAL EXPENDITURES**
**(By NERC Region — In $ millions)**

| Region | 1988 | 1989 | 1990 | 1991 | 1992 | 5-Year total |
|---|---|---|---|---|---|---|
| ECAR | $ 3,303 | $ 3,204 | $ 2,756 | $ 2,460 | $ 2,022 | $ 13,745 |
| ERCOT | 1,676 | 1,264 | 1,188 | 1,184 | 1,502 | 6,814 |
| MAAC | 3,182 | 2,939 | 3,012 | 2,729 | 2,195 | 14,057 |
| MAIN | 1,897 | 1,490 | 1,428 | 1,370 | 1,503 | 7,688 |
| MAPP | 1,029 | 1,112 | 1,102 | 1,090 | 1,020 | 5,353 |
| NPCC | 1,876 | 1,726 | 1,782 | 1,800 | 1,518 | 8,702 |
| SERC | 7,189 | 6,766 | 7,030 | 6,703 | 6,224 | 33,912 |
| SPP | 1,463 | 1,360 | 1,310 | 1,389 | 1,369 | 6,891 |
| WSCC | 5,870 | 4,784 | 4,504 | 4,565 | 4,886 | 24,609 |
| Total | $27,485 | $24,645 | $24,112 | $23,290 | $22,239 | $121,771 |

**PROJECTED 5-YEAR CAPITAL EXPENDITURES**
**(By Function — In $ millions)**

| Function | 1988 | 1989 | 1990 | 1991 | 1992 | 5-Year total |
|---|---|---|---|---|---|---|
| Generation | $ 12,296 | $ 10,769 | $ 9,443 | $ 8,199 | $ 8,385 | $ 49,092 |
| Substations | 1,371 | 1,384 | 1,225 | 1,360 | 1,175 | 6,515 |
| Transmission | 2,558 | 2,376 | 2,397 | 2,795 | 3,092 | 13,218 |
| Distribution | 7,979 | 7,010 | 7,929 | 7,882 | 6,965 | 37,765 |
| Other | 3,281 | 3,106 | 3,118 | 3,054 | 2,622 | 15,181 |
| Total | $27,485 | $24,645 | $24,112 | $23,290 | $22,239 | $121,771 |

About half the utilities in ECAR say they are pursuing life extension programs, but about half of these are still in the study stage.

ECAR utilities plan to add several medium- to large-size generating units (400-1300 MW) in the mid-1990s, but most of the capacity to be added will be units of less than 100 MW.

**ERCOT**

| | Gen | T&D | Other |
|---|---|---|---|
| 1988 | 584 | 845 | 247 |
| 1989 | 326 | 759 | 179 |
| 1990 | 207 | 815 | 166 |
| 1991 | 226 | 781 | 177 |
| 1992 | 476 | 753 | 273 |
| Total | 1,819 | 3,953 | 1,042 |

Texas utilities will spend $6.8-billion for new plant and system in the next five years, with the heaviest investments coming in 1988 and 1992. The survey indicates that generation spending has been slashed from a year ago, with twice as much to be spent for T&D facilities. Generation spending should total something in the range of $1.8-billion, according to survey projections, well below 1986. Power delivery investment will be almost $4.2-billion. Spending in the Other category will hit a 5-year high in 1992, at $273-million.

The majority of utilities report some life extension work, mostly active. This represents an increase in this activity from a year ago.

Little new capacity will be needed before the mid 1990s, mostly in units rated less than 100 MW. As reported a year ago, several larger baseload units will be needed by the latter 1990s.

**MAAC**

| | Gen | T&D | Other |
|---|---|---|---|
| 1988 | 1,574 | 1,066 | 542 |
| 1989 | 1,501 | 953 | 485 |
| 1990 | 1,349 | 1,166 | 497 |
| 1991 | 1,059 | 1,153 | 517 |
| 1992 | 849 | 955 | 391 |
| Total | 6,332 | 5,293 | 2,432 |

Mid-Atlantic Area Council utilities will invest $14-billion for new facilities in the 1988-1992 period. About 44 percent of this capital investment will go for new and upgraded generation facilities, declining steadily from $1.6-billion in 1988 to less than $850-million in 1992. T&D spending for the 5-year period will total $5.3-billion, or about 38 percent. MAAC utilities will need new capacity before 1995. Although some units rated higher than 500 MW currently are planned, the majority of new capacity will be less than 100 MW in size.

The majority of MAAC utilities are involved in some kind of life extension work, although some still is in the analysis and evaluation stage.

**MAIN**

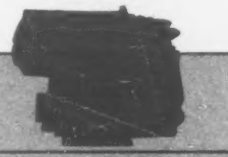
| | Gen | T&D | Other |
|---|---|---|---|
| 1988 | 943 | 773 | 181 |
| 1989 | 564 | 756 | 170 |
| 1990 | 457 | 820 | 151 |
| 1991 | 386 | 839 | 145 |
| 1992 | 273 | 1,116 | 114 |
| Total | 2,623 | 4,304 | 761 |

Utilities in the Mid-America Interpool Network, comprised of utilities in Illinois, Eastern Wisconsin and Northeastern Missouri, will invest substantially more for transmission and distribution in the next five years ($4.3-billion) than for generation ($2.6-billion). In 1992, MAIN utilities will invest four-times as much on power delivery facilities as on generation.

The MAIN region has a large reserve margin and little new capacity will be needed until the mid-1990s. What capacity that is added largely will be under 100 MW in size, for peaking. After 1995, there is a potential need for several larger units, in the 500-MW range.

About 30 percent of MAIN utilities are involved in some form of life extension study or actual work.

**MAPP**



| | Gen | T&D | Other |
|---|---|---|---|
| 1988 | 352 | 471 | 206 |
| 1989 | 476 | 449 | 187 |
| 1990 | 406 | 476 | 220 |
| 1991 | 404 | 496 | 190 |
| 1992 | 297 | 454 | 269 |
| Total | 1,935 | 2,346 | 1,072 |

The Mid-Continent Area Power Planners pool is the smallest NERC region, electrically. Utilities will invest $5.3-billion in new facilities over the next five years, with T&D spending ($2.3-billion) exceeding generation spending ($1.9-billion) by about $400-million.

About 40 percent of MAPP utilities are involved in some form of generating plant life extension, largely active projects. This represents a substantial increase in life extension activity in the area since last year.

Some new generating capacity will be needed in the late 1990s, largely units rated at 100 MW or less, although there may be several larger units rated 400 MW or more.

**NPCC**

| | Gen | T&D | Other |
|---|---|---|---|
| 1988 | 552 | 1,080 | 244 |
| 1989 | 472 | 985 | 269 |
| 1990 | 493 | 1,039 | 250 |
| 1991 | 531 | 1,039 | 230 |
| 1992 | 450 | 909 | 159 |
| Total | 2,498 | 5,052 | 1,152 |

Utilities in the Northeast Power Coordinating Council are depending on power from Canada to make up for regional capacity deficiencies through the 1990s. For this reason, NPCC utilities will spend about twice as much for power delivery facilities ($5.1-billion), including EHV/UHV/DC interconnections with Canadian utilities, as for generating facilities ($2.5-billion). What new capacity that is added will go on line in the latter years of the century and will likely be small modules, rated under 400 MW.

About 20 percent of NPCC utilities are involved in life extension work, although a number say they are thinking about it.

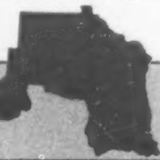
**SERC**

| | Gen | T&D | Other |
|---|---|---|---|
| 1988 | 4,112 | 2,561 | 516 |
| 1989 | 3,740 | 2,425 | 601 |
| 1990 | 3,767 | 2,610 | 653 |
| 1991 | 3,265 | 2,888 | 550 |
| 1992 | 3,423 | 2,249 | 552 |
| Total | 18,307 | 12,733 | 2,872 |

The Southeastern Electric Reliability Council is the largest NERC area for demand and capacity, and it ranks first in terms of capital investment. Growth in utility capital investment mirrors projected economic growth in the area for the next five years. Total investment for facilities will be $33.9-billion, or more than one-fourth of all industry capital investment for the period. To meet demand increases, SERC utilities will invest $18-billion for new generating facilities, with investment running fairly even after 1988. During the period, SERC utilities will invest $12.7-billion for power delivery systems, divided fairly evenly annually throughout the period.

Larger utilities say they will build 300-800 MW units, but most new generating capacity will go in in small increments.

About 25 percent of utilities have active life extension programs.



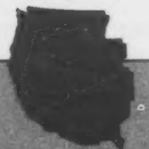
**SPP**

| | Gen | T&D | Other |
|---|---|---|---|
| 1988 | 439 | 805 | 219 |
| 1989 | 387 | 785 | 188 |
| 1990 | 343 | 791 | 176 |
| 1991 | 375 | 814 | 200 |
| 1992 | 415 | 777 | 177 |
| Total | 1,959 | 3,972 | 960 |

Southwest Power Pool utilities will devote the majority of their capital investment to power delivery facilities in the 1988-1992 period. They will spend almost $4.0-billion for substations and T&D lines, with the spending averaging rather consistently close to $800-million per year. Generation spending dips in the middle three years of the period, but bounces back above the $400-million level in 1992.

Units added will most likely be less than 100 MW in size. These will be added largely between 1993 and 1997. Total spending by SPP utilities is projected at $6.9-billion for the period.

Less than 20 percent of SPP utilities report life extension programs, largely in the study stage.



**WSCC**

| | Gen | T&D | Other |
|---|---|---|---|
| 1988 | 1,830 | 3,198 | 842 |
| 1989 | 1,428 | 2,636 | 720 |
| 1990 | 1,049 | 2,775 | 680 |
| 1991 | 912 | 2,893 | 760 |
| 1992 | 1,441 | 3,014 | 431 |
| Total | 6,660 | 14,516 | 3,433 |

The Western States Coordinating Council is the largest NERC region in geographical area and ranks second in capital investment behind SERC. It remains one of the fastest growing regions of the country. During the next five years, WSCC utilities will invest almost $25-billion in new facilities, spread rather evenly over the last four years of the period after a high of $5.9-billion in 1988. WSCC utilities will invest more than twice as much ($14.5-billion) in power delivery facilities as they will spend for generation improvements ($6.7-billion). Generation spending will hit a low of $900-million in 1991, then rebound in 1992 to $1.4-billion.

WSCC utilities will need new capacity in the latter years of the century, largely in increments of 400 MW or less.

Only 15 percent of WSCC utilities have life extension programs, and less than half are active projects.

## Power theft course planned for Feb.

LENOIR CITY, TN—An advanced course about power theft and revenue recovery is scheduled for New Orleans on Feb. 8-10, 1988. The course is designed for utility emplyees who have attended basic power-theft courses or who have experience in the field.

The presenter, Corporate Consultants, has been giving such courses for almost 10 years. Topics to be covered include organized crime investigations, crime scene photography, interviewing techniques, and software applications.

For more information, contact Corporate Consultants at 615/986-8026.

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The Retrofit Electronics Kit installs in minutes.

# Generation Update

## Palo Verde staffing restructured and downsized

PHOENIX, AZ—Management and organization of the three-unit Palo Verde Nuclear Generating Station have been completely revised and downsized in what may be the industry's first successful large-scale restructuring of a nuclear power plant not beset with problems.

Goal of the program, according to Arizona Public Service Co. President Mark De Michele, is to enhance the safe operation of all three Palo Verde units, as well as reduce the cost of power.

To accomplish this, the number of management levels has been reduced, specifically between De Michele's office and first-line managers, which has improved communications and action response time.

In addition, management positions were slashed by almost 18 percent and the number of contract personnel is being reduced.

Total annual savings are projected at about $40-million.

### Voluntary effort

The restructuring, which was not precipitated by actions or criticisms from either the NRC or state regulators, culminated from a study initiated by De Michele and was a proactive effort to downsize the Palo Verde organization consistent with the transition from construction to operation. Unit 3, newest of the three reactors, is expected to be in commercial operation next month, prior to the first refueling outage of Unit 2 in the Spring. Unit 1 entered its first refueling outage last October.

### New organization

The Palo Verde facility is comprised of three physically separate units, sharing virtually no common systems. Each of these now is under the responsibility of a separate plant manager. A separate Nuclear Production Support organization provides operational and logistical support to all three units and a Standards and Technical Support group provides engineering and technical backup.

Safety and licensing functions were combined and elevated in the new organization. Operational functions also were elevated and management personnel with operating experience were reassigned to key operating roles.

The new organization was favorably received by the NRC, which formally approved the revised Technical Specifications describing the organization.

### Benefits

The new Palo Verde organization provides a strong balance of workloads and responsibilities for top nuclear executives. Other benefits include:

○ The maximum number of management levels was reduced from seven to five. Shortened chains of command tend to enhance communications and reduce action response times. Jerry Haynes, nuclear production vice president, told the NRC commissioners at the full-power hearings for Palo Verde, that "the new organizational structure has improved communications flow significantly in both directions."

○ The number of management positions (supervisor and above) was reduced by 39, or 17.8 percent, to a total of 180.

○ A plan to phase out approximately 800 contract personnel has been initiated.

APS expects to achieve increased productivity at Palo Verde with less management through the use of better-defined "missions" for each organization. By eliminating the overlaps of management levels, quicker response time is anticipated. Disputes and jurisdictional or "turf" battles over responsibilities will be minimized, which means that fewer management personnel will be involved in review and coordination roles. The aim is toward single-point responsibility, so that personnel at all levels will receive clear directions and understand their respective responsibilities.

The staffing level of certain departments was reduced over 50 percent. Some departments were eliminated in total, with their functions being assumed by some other group. Other departments were maintained at their existing staffing levels, or even increased slightly.

By comparison, across-the-board uniform reductions would have severely penalized those organizations that already were operating most efficiently.

Assessment of the Palo Verde organization was initiated during 1986

Continued on page 28

## $48 billion of electricity produced in U.S. during 1986

WASHINGTON—Total variable costs of electricity produced in the United States by central-station steam-electric plants in 1986 were more than $48 billion, according to the Utility Data Institute. Its annual production-cost report shows data for 389 coal-fired plants, 135 gas-fired plants, 74 oil-fired, 61 nuclear, and eight other types.

Together, these 667 facilities generated 2.1-billion net megawatts in 1986, which represented 98 percent of all steam-electric generation in the U.S. for the year.

### Cost rankings

Nuclear plants, as a group, were the lowest cost, producing 19 percent of that total U.S. electricity at an average variable cost of $19.05 per net megawatthour. Net rates for the other fuels were coal at $21.64/MWh, gas at $30.43/MWh, oil at $33.99/MWh, and others at $33.35/MWh.

In terms of least-expensive electricity, the top 20 included 11 nuclear plants, eight coal-fired, and one gas-fired. Interestingly, the top of the top 20 was the gas-fired plant, Rio Pecos of West Texas Utilities, at $5.42 per net MWh. This top position has "belonged" to the Rio Pecos plant since 1981. Second was the embattled Maine Yankee nuclear plant at $6.67/MWh. (See the related story in last issue about the Maine Yankee facility.)

UDI's report is slightly different from *Electric Light & Power*'s annual list (see the August issue). UDI considers total plant or station heat rate, while *EL&P* lists individual unit heat rates.

### Heat rate rankings

The rankings of average plant heat rates (Btu per kilowatthour generated) includes only fossil plants because of inconsistencies in the way nuclear data are reported.

The top five with the most-efficient heat rates in 1986 included two combined-cycle and three coal-fired plants. First in the rankings was Public Service of Oklahoma's Comanche combined-cycle plant at a heat rate of 8821. Second was TVA's Bull Run coal-fired plant at 8870. Third through fifth were: Massachusetts Municipal Wholesale Electric's Stonybrook combined-cycle facility; and Duke Power's coal plants at Belew's Creek and its Marshall station.

### Size rankings

In terms of the most electricity generated last year, Georgia Power's 3499-MW, coal-fired, Bowen station ranked first, with more than 21-million MWh (net). This was followed by Houston Lighting & Power's Parish coal-fired plant at 17.2-

Continued on page 28

**TOP 20 U.S. STEAM-ELECTRIC PLANTS IN 1986**
**RANKED BY BTU PER KILOWATTHOUR**

| No. | Plant/Unit | Heat Rate (Btu/kWh) | Operator | Primary Fuel Type | 1986 Installed Capacity | 1986 Net Generation (MWh) |
|---|---|---|---|---|---|---|
| 1 | Comanche (OK) | 8821 | Public Service Oklahoma | CCYC | 290 | 833,366 |
| 2 | Bull Run | 8870 | Tennessee Valley Auth | COAL | 950 | 6,346,163 |
| 3 | Stonybrook | 8871 | Mass Muni Whsl Elec | CCYC | 358 | 602,217 |
| 4 | Belews Creek | 9005 | Duke Power | COAL | 2160 | 14,200,705 |
| 5 | Marshall (NC) | 9060 | Duke Power | COAL | 1996 | 9,552,389 |
| 6 | JH Campbell | 9252 | Consumers Power | COAL | 1420 | 9,236,950 |
| 7 | Morgantown | 9265 | Potomac Electric Power | COAL | 1252 | 6,844,141 |
| 8 | Crystal River 4&5 | 9293 | Florida Power | COAL | 1479 | 9,328,849 |
| 9 | Mountaineer | 9297 | Appalachian Power | COAL | 1300 | 8,989,569 |
| 10 | Gallatin | 9340 | Tennessee Valley Auth | COAL | 1255 | 6,637,072 |
| 11 | Amos | 9376 | Appalachian Power | COAL | 2933 | 14,612,220 |
| 12 | Cross 2 | 9399 | South Carolina Pub Serv | COAL | 556 | 2,739,605 |
| 13 | Mount Tom | 9421 | Holyoke Water Power | COAL | 136 | 1,078,095 |
| 14 | New Boston | 9435 | Boston Edison | OIL | 718 | 4,312,238 |
| 15 | Bay Shore | 9436 | Toledo Edison | COAL | 639 | 3,932,403 |
| 16 | Milliken | 9489 | New York State Elec & Gas | COAL | 316 | 1,390,679 |
| 17 | New Haven Harbor | 9499 | United Illuminating | OIL | 460 | 2,421,501 |
| 18 | Putnam | 9500 | Florida Power & Light | CCYC | 580 | 2,253,544 |
| 19 | McMeekin | 9507 | South Carolina Elec & Gas | COAL | 294 | 1,488,733 |
| 20 | Somerset 1 | 9516 | New York State Elec & Gas | COAL | 655 | 4,535,798 |

Source: "1986 Production Costs, Operating Steam Electric Power Plants," Utility Data Institute.

**TOP 20 U.S. STEAM-ELECTRIC PLANTS IN 1986 RANKED**
**BY AVERAGE EXPENSES (INCL. FUEL) PER NET MEGAWATTHOUR**

| No. | Plant/Unit | Average Expenses/ Net MWH | Operator | Primary Fuel Type | 1986 Installed Capacity | 1986 Net Generation (MWh) |
|---|---|---|---|---|---|---|
| 1 | Rio Pecos | 5.42 | West Texas Utilities | GAS | 142 | 917,560 |
| 2 | Maine Yankee | 9.67 | Maine Yankee Atomic Power | UR | 864 | 6,241,756 |
| 3 | North Anna | 10.77 | Virginia Elec & Power | UR | 1959 | 12,332,789 |
| 4 | Laramie River | 10.86 | Basin Electric Power | COAL | 1710 | 9,215,540 |
| 5 | Hayden | 10.99 | Colorado-Ute Elec | COAL | 465 | 2,962,461 |
| 6 | Point Beach | 11.69 | Wisconsin Elec Power | UR | 1048 | 7,185,182 |
| 7 | Calvert Cliffs | 11.71 | Baltimore Gas & Elec | UR | 1829 | 12,827,653 |
| 8 | Zion | 11.94 | Commonwealth Edison | UR | 2196 | 12,239,103 |
| 9 | Callaway 1 | 12.08 | Union Electric | UR | 1236 | 7,170,229 |
| 10 | Prairie Island | 12.14 | Northern States Power | UR | 1186 | 7,679,683 |
| 11 | Antelope Valley | 12.45 | Basin Electric Power | COAL | 870 | 4,319,459 |
| 12 | St. Lucie | 12.86 | Florida Power & Light | UR | 1700 | 13,180,343 |
| 13 | Trojan | 12.91 | Portland General Elec | UR | 1216 | 7,090,231 |
| 14 | Nine Mile Point | 12.96 | Niagara Mohawk Power | UR | 842 | 3,146,883 |
| 15 | Iatan | 13.02 | Kansas City Power & Light | COAL | 726 | 3,969,421 |
| 16 | Monticello (TX) | 13.09 | Texas Utilities Elec | COAL | 1980 | 13,270,109 |
| 17 | Coal Creek | 13.45 | Cooperative Power | COAL | 1100 | 6,220,312 |
| 18 | Clifty Creek | 13.56 | Indiana-Kentucky Elec | COAL | 1304 | 9,733,628 |
| 19 | Kewaunee | 13.77 | Wisconsin Public Service | UR | 535 | 3,854,674 |
| 20 | JS Cooper | 14.10 | East Kentucky Power | COAL | 321 | 1,772,335 |

Source: "1986 Production Costs, Operating Steam Electric Power Plants," Utility Data Institute.

## Palo Verde staffing...from page 24

with the formation of a team of in-house managers to look for ways to better align the utility and nuclear facility organizations. There was an initial concern that the nuclear facility was forming a corporate culture and organization separate from that of the utility. Duplicated efforts were found that left no clear accountability for certain areas, said Edwin E. Van Brunt, executive vice president of Arizona Nuclear Power Project, the official corporate designation of Palo Verde. The task force recommended a careful review of the nuclear plant organizations.

Based on the task force recommendations, a consulting firm specializing in the nuclear power industry—DHL Associates, Inc.—was contracted to review organization, staffing and work procedures at Palo Verde. DHL was selected because of prior experience with the organization and staffing of a two-unit nuclear plant in the East and because its nine consultants brought a breadth, as well as depth, of experience totalling more than 150 years of nuclear experience.

Each department at Palo Verde was assigned to a DHL team-member with expertise in that particular area. The consultants interviewed more than 50 Palo Verde managers and senior management officials in structured interviews, seeking information and perceptions of organizational strengths, weaknesses and staffing levels. The interviewers also sought ideas for enhancing Palo Verde's performance.

Following completion of the interviews, DHL personnel conducted an in-depth review of the data obtained, identifying redundancies and overlaps in work performance. Staffing levels were compared with those observed at other nuclear plants. Follow-up questions and observations of work flow were initiated in areas where the scope of the work being done appeared inconsistent with the resources used.

Detailed investigations were performed in the following areas:

○ Engineering work authorization processes

○ Work order process and the control of maintenance

○ Procedures for surveillance tests and preventive maintenance

○ Records management systems, including microfilming, configuration control and document distribution.

This data then was combined with suggestions from Palo Verde management and was used to develop preliminary recommendations of functions that should be consolidated and appropriate staffing levels for each department.

In mid-May, 1987, the DHL team met in Phoenix for a peer review of the preliminary recommendations. This approach was suggested by Victor Gilinsky, former NRC commissioner and now a DHL task-force member, who said "If we can't convince each other that our recommendations are valid, then we should not be making these recommendations to the client."

The peer review solidified many preliminary recommendations that were aggregated into an overall organizational structure for Palo Verde. The DHL recommendations then were sent to APS for review and action.

By mid-June, the recommendations had been reviewed by APS executives, both nuclear and non-nuclear, and needed modifications were incorporated. This was followed by the selection of personnel for director-level positions. Concurrently, discussions were commenced with NRC officials. Proposed modifications to the Technical Specifications (Section 6) were filed during the first week of August and approved in October. In the interim, supervisory positions and detailed staffing plans were established for both the utility and for contractors.

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## *Seismic consulting services offered*

WALNUT CREEK, CA—Specialized seismic and structural engineering services now are being offered to nuclear utilities by Impell Corp. A new business unit has been formed to provide these services and will concentrate its efforts on the critical seismic issues currently being studied by utility groups and the Nuclear Regulatory Commission.

Specific areas of effort include seismic margin reviews, seismic fragility, development of seismic criteria and probabilistic assessment for nuclear plants.

Dr. Donald A. Wesley, with 21 years of earthquake engineering experience, much of it related to nuclear safety, will head the unit. The unit will be headquartered in Santa Ana, CA.

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## Electricity...

### from page 24

million MWh. The next three in the top five were: Duke Power's Parish coal-fired facility (17.2-million MWh) and its Oconee nuclear plant (16.6); and Public Service of Indiana's Gibson coal unit (16.4).

In addition to the three performance rankings, the report includes variable production costs, with and without fuel, for each of the 667 plants listed.

The complete report, "1986 Production Costs: Operating Steam Electric Plants", is available from: Utility Data Institute Inc., 1700 K St., NW, Suite 400, Washington, DC 20006, for $120 (utilities) or $150 (nonutilities).

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FEBRUARY 1988 Volume 66, Number 2 A PENNWELL PUBLICATION

ELECTRIC LIGHT & POWER

EL&P

VOICE OF THE ELECTRIC UTILITY INDUSTRY

# Ice storms darken Southwest utilities

## 'Worst in 50 years;' 9-day outages; crews from 6 states assist

Mark T. Hoske
Assistant Editor

A Dec. 25-26 ice storm felled trees and damaged lines from south central Oklahoma to southeastern Missouri causing week-long power outages for tens of thousands of customers and still untotalled millions of dollars in damage.

As of press time, not all figures were available, but utility and regulatory personnel in the region agree that it was the worst ice storm they've seen...ever. While damages were estimated to be enormous, no injuries were reported.

Officials praised the dedication of crews, many of whom worked through two holidays. Commradery prevailed as crews from six states assisted.

Here are samples of outages, repairs and conditions encountered from some of the affected utilities.

### PS of Oklahoma

Public Service of Oklahoma, based in Tulsa, OK, may have suffered the worst damage with estimates approaching $4.5 million. The around-the-clock effort to restore Tulsa's power cost at least $3 million.

Cumulatively, about 114,000 Tulsa customers lost power during the crisis. One week after the storm began, PSO had restored 90 percent of its service, but some customers were still without power nine days after the storm hit.

Work crews chip away at 2 inches of ice to repair a portion of an estimated $4.5 million in damage to Public Service of Oklahoma's system. The Dec. 25-26 storm caused up to 114,000 PSO customers to lose power during the nine-day ordeal. Cleanup continues in four states.

At the peak, as many as 67 feeder lines, of 225, were interrupted. Each serves 800 to 1000 customers.

### Nearly everyone helped

Eighty line and service crews and 90 tree trimming crews, totalling 773 workers, worked on PSO's outage. Help came from Kansas Gas & Electric, Kansas City Power, Arkansas Power & Light, Dallas Power & Light, Southwestern Electric Power Co., and 20 contracted companies.

PSO's Nancy Harlow said Tulsa may have been hit harder than other areas of the state because above-average rainfall over five years had promoted increased tree growth.

The ice's weight caused most of the destruction, sticking to trees for days. Wind gusts exacerbated the problem.

Harlow emphasized that PSO's annual tree trimming budget increased steadily from $2.54 million in 1984 to $3.32 million in 1986. Through November 1987, $3.2 million was spent, with a 51-percent increase for its Tulsa division alone.

"No amount of tree trimming could have prevented the damage we sustained to our system," maintained Charles Peck, the utility's

continued on page 3

# PacifiCorp, UP&L shareholders approve merger; talks run on

PORTLAND, OR—Shareholders of PacifiCorp and those of Utah Power & Light Company have overwhelmingly approved a merger of the two companies.

But regulatory approval is still needed in seven states and on the federal level.

Chris Hunter, PacifiCorp spokesperson, said public power interests have expressed concern that the merger would inhibit the wheeling of electricity through the region's transmission lines. Hunter said both companies have dealt fairly with smaller utilities in the past and would continue to do so.

Another question up for debate, Hunter said, is how the anticipated cost savings of the merger would be divided between customers of each state and stockholders. Regulatory hearings are completed in Montana and Wyoming; decisions are anticipated by the end of February.

The two companies have said if the merger is not successful by Aug. 12, one year after the intention was announced, they may terminate the agreement.

"We're trying to keep things moving," Hunter explained.

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## LATE NEWS

**Public Service of New Hampshire,** denied a 15-percent emergency rate hike by the state supreme court, Jan. 28 filed for protection from creditors under Chapter 11 of the federal bankruptcy code, the first such filing in nearly 50 years. PSNH owns 36.5-percent of the $5-billion Seabrook nuclear plant. PSNH defaulted on more than $47 million in interest payments; opponents argue financial conditions should prevent Seabrook licensing. See full report in March *EL&P*.

**The U.S. Supreme Court** will decide if foreign uranium can be used for U.S. power generation. DOE refused to comply with a law requiring it to restrict foreign uranium-use after it found the U.S. uranium industry "not viable." The U.S.-Canada Trade Treaty would exempt Canada, the largest foreign uranium supplier to the U.S.

**Pacific Gas & Electric** has withdrawn its proposal to acquire Sacramento Municipal Utility District.

# DOE to pay TVA $1.8 billion to settle generation dispute

WASHINGTON—The U.S. Department of Energy agreed to pay the Tennessee Valley Authority $1.791 billion over the next seven years to settle a contractual dispute over generation capacity.

The payment compensates TVA for capacity it developed at DOE's request, but which DOE now says it won't need. DOE contracted for the power in the late 1960s and 1970s in anticipation of increased demand for uranium enrichment, demand that did not occur.

### Mutually beneficial

Spokespersons for both sides said the settlement is mutually beneficial.

As a result of the settlement, TVA reduced rates by 6 percent effective Jan. 2. Mostly to compensate for lower DOE payments, TVA had increased rates by 7.8 percent amount last Oct. 2. The DOE reported a savings of $650 million over their original contractual agreement.

As reported in October's *EL&P*, during negotiations between the federal agencies, TVA had asked the DOE to pay as much as $2.5 billion between 1987 and 1995.

# Nevada site chosen for tests of high-level nuclear waste

WASHINGTON—In what looks like a "not-in-my-backyard" decision, Congress agreed to test only one Nevada site for the country's first high-level nuclear depository.

Yucca Mountain, a corner of a Nevada atomic testing site, was chosen to be the probable site of the high-level radioactive waste storage facility and will be tested and studied to ensure its suitability. Other potential sites in Washington and Texas will not be tested.

### Objections from Nevada

Nevada Sen. Harry Reid called the decision, which was attached to the budget package and signed into law, "An exercise of raw politics without even a measure of fairness or objectivity."

The measure postpones the search for a second site for 20 years and nullifies selection of Tennessee for a monitored retrievable storage facility. It also reduces annual payments to Nevada from a proposed $100 million year to just $10 million a year, increasing to $20 million a year once the site receives waste.

Department of Energy sources have said construction at Yucca Mountain wouldn't begin until the late 1990s.

# News Briefs

JILL MINNER, Assistant Editor

## Bechtel Power Corp. and PG&E plan to form joint venture

● Pacific Gas and Electric Company and Bechtel Power Corporation have announced plans to form a joint venture. The companies said their venture would work with participants in the nonutility electric generation field in developing, managing, owning and operating facilities nationwide. "We think that this venture will assist us in responding to emerging trends in the electric generating business," stated Bechtel President Cordell W. Hull. According to the companies, they will work together on a project-by-project basis until a definitive joint venture agreement is reached. A PG&E spokesperson said the companies will probably begin by looking at opportunities on the East Coast or in the Northeast where the demand for additional power is greatest.

## HIPDC awards C-E/Sulzer Bros. $115-million boiler contract

● According to Combustion Engineering, Inc. (C-E), its Power Systems Group and the Sulzer Brothers of Winterthur, Switzerland have received a contract to provide two 600-MW steam generators to Hunaneng International Power Development Corp., People's Republic of China. C-E said the contract, valued at over $115 million, represents the first application of supercritical pressure technology for steam generation in China. The company expects to begin equipment deliveries by January 1989 and has scheduled commercial operations for November 1990 and July 1991.

## Huntington named NEPOOL Executive Committee Chairman

● The New England Power Pool (NEPOOL) Executive Committee has selected Samuel Huntington as chairman. He is currently president and CEO of New England Electric System. "In the months and years ahead, New England will be facing potential power shortages that will call for some tough decisions regarding electrical supply and consumption," noted Huntington. "I am confident, however, that by coordinating their efforts through a regional power system like NEPOOL, the utilities can meet these challenges most effectively," he added. Huntington succeeds Stephen J. Sweeney as chairman. Sweeney, Chairman and CEO of Boston Edison, will continue to serve as a member of the committee. NEPOOL said its executive committee is in charge of bulk power coordination and regional energy planning policies for 95 participants.

## Burstein says nuclear energy necessary to meet future needs

● According to Sol Burstein—who guided the design and construction of Wisconsin Electric Power Company's Point Beach Nuclear Plant in the late 60s and early 70s—nuclear power offers one of the best prospects for providing the nation's future energy needs. "As needs and requirements change, our country will have to adapt," predicted Burstein, who recently retired as vice chairman of the utility. "If reason prevails we'll recognize that nuclear energy is necessary, as much of the world has. The obstacles to nuclear in this country now are not so much technical or economic, but are institutional or political," he added. In regard to the 'obstacle' of nuclear waste Burstein said, "There is no greater nonsense than how we are handling nuclear waste. We all want the benefits but none of the costs associated with them."

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EL&P readers whose responsibilities include both Generation and Transmission/Distribution receive both technology sections. Other readers receive the technology section that applies to their respective area of responsibility. The Generation edition is indicated by a single dot (•) in the upper right corner of page 1; the T/D edition carries two dots (••). All readers receive EL&P's industry news section.

## Outplacement consulting firm predicts major utility layoffs

● In its annual forecast, Lee Hecht Harrison, Inc. predicts that many utility companies will be involved in major layoffs, due to the completion of a large number of long-term projects. Cutbacks of middle and senior-level management in all industries will increase this year, but at a slower rate than in 1987, according to the outplacement consulting firm. Lee Hecht Harrison said the forecast was conducted from an informal survey of human resources managers and other executives, and is based on overall trends observed prior to recent stock market uncertainty.

## Electric utilities' demand for coal to rise in '88: NCA forecast

**Electric Utilities**
**Percent Generation By Fuel**

| | Coal | Oil/Gas | Nuclear | Hydro/Other | Electricity Growth Rate |
|---|---|---|---|---|---|
| 1985 | 56.8 | 15.9 | 15.5 | 11.8 | 2.2 |
| 1986 | 55.7 | 15.5 | 16.6 | 12.2 | 0.7 |
| 1987 (1) | 56.0 | 15.2 | 18.0 | 10.8 | 3.5 |
| 1988 (2) | 55.0 | 14.4 | 18.8 | 11.8 | 2.0 |

1) Preliminary
2) Forecast

Source: The National Coal Association

● The National Coal Association (NCA) said it expects electric utilities to demand 715 million tons of coal in 1988, slightly higher than 1987's record forecast of 714 million tons. In addition, electrical generation—affected by slower economic growth and a reduced level of industrial activity—will rise 2.0 percent this year, assuming normal weather patterns. NCA predicts that coal's share of the generation market will decline from 56 percent in 1987 to 55 percent, and nuclear's share will increase to 18.8 percent (see table).

## Low-power license approved for ComEd's Braidwood Unit 2

● The Nuclear Regulatory Commission has issued a low-power operating license to Commonwealth Edison for Unit 2 of its Braidwood generating station. Edison said it will now begin an extensive testing program, gradually increasing power levels to five percent of rated capacity. The company expects Unit 2 to be in service by mid-1988. According to Edison, the completion of Braidwood marks the end of the utility's construction program which began in the early 1970s. "...the Braidwood plant has been completed at a far lower cost than any other new U.S. nuclear plant," said Edison Chairman James J. O'Connor, "While other areas of the country face a shortage of electrical capacity...our customers will have an adequate supply."

## BPA adds third element to experimental partnership program

● As part of a partnership program, the Bonneville Power Administration (BPA) said it will offer assistance to new and expanding industries if they adopt state-of-the-art energy saving technologies. According to BPA, the purpose of its program is to assist its customers in marketing surplus power within the Pacific Northwest and to stabilize BPA revenues. The existing two parts of the program include: 1) supporting the use of electricity in place of wood heating through a short-term rate discount; and 2) offering assistance in designing energy savings into new commercial buildings.

## EUA buys over 50% in common shares of NECO Enterprises

● Eastern Utilities Associates (EUA) has signed an agreement with David F. LaRoche to purchase approximately 52 percent in common shares of NECO Enterprises, Inc. EUA said it will seek to acquire all other common shares of NECO—parent company of Newport Electric Corporation. The transaction is currently pending approval of the EUA Board of Trustees and the Securities and Exchange Commission.

## SERI continuing education program brings faculty to worksite

● System Energy Resources Inc. (SERI) recently honored the first graduate of its continuing education program at Grand Gulf nuclear station. SERI said its program, which began at Grand Gulf in September 1985, is unique in the nuclear industry because it brings college faculty to the job site and works class time around the normal shifts of employees. Drew Bottemiller, a supervisor in SERI's Training Department, was the first to receive a bachelor of science degree in nuclear engineering technology through the program. "The pace of technological and regulatory changes in the nuclear industry calls for a better educated work force, more than ever before," noted Oliver Kingsley, vice president-nuclear operations at SERI. "This program was the best and only way we could provide a fully accredited engineering degree to all our employees," he added. The utility said classes are taught for 12 weeks on a quarter system and that coursework includes general education, mathematics, nuclear reactor fundamentals and advanced nuclear technology.

## GPU appoints Kuhns chairman and chief executive officer

● General Public Utilities Corporation (GPU) has announced the appointment of William G. Kuhns as chairman and chief executive officer. He succeeds John F. O'Leary who died of cancer in December. Kuhns previously served as chairman and CEO at GPU before he retired in May 1987.

# Editorial

## U.S. apparatus suppliers merit international trade equality

If the American economy is to grow and prosper, something must be done to reduce the mounting balance of international payments deficit. To this end, U.S. manufacturers and producers must improve on past performances in the international marketplace. But if this is going to happen, substantive changes in the rules by which we and our trading partners compete must occur.

This is no remote economic theory. It is a matter of potential life-threatening illness or health for some groups of U.S manufacturers, with domestic producers of heavy electrical equipment right up there at or near the top of the list of those needing relief. When manufacturers of electrical apparatus face serious problems, then utilities also face future uncertainties with regard to equipment availability—something that cannot be tolerated for long.

The problem for U.S. electrical equipment manufacturers is simply that while many foreign markets are effectively foreclosed to them by virtue of both tariff and non-tariff barriers, foreign electrical manufacturers from those protected nations are free to sell in the U.S. Moreover, in some cases, offshore suppliers are given subsidies or other incentives from their governments that allow them to reduce prices to levels below those of American manufacturers or even to less than in their own domestic market.

Over the years, negotiators at General Agreement on Tariffs and Trade (GATT) meetings have considered the problem. Going back to the Kennedy Round of GATT negotiations in the '60s, there was a strong thrust by American negotiators to obtain reductions in tariffs. In the 1979 Tokyo Round, further reductions in tariffs were sought, and elimination (or at least reduction) of non-tariff barriers were sought.

Unfortunately, utility equipment somehow was largely bypassed in the discussions. As one Commerce Department staffer told *EL&P* awhile back, "Face it, electrical equipment was trade bait, and was sacrificed for more important classes of products," like agricultural goods, among others.

So protectionalism continues to exist in many markets around the globe, while foreign equipment suppliers are enjoying a largely free pass to cultivate customers in the U.S. American apparatus manaufacturers simply cannot sell in many developed offshore markets and free competition in non-developed nations has been reduced by virtue of subsidies offered by some offshore manufacturers. And at home U.S. apparatus producers face increasing competition for utility business from foreign suppliers manufacturing offshore. It's not surprising so many have sought, or at least accepted "help" in the form of various types of partnerships with foreign manufacturers.

Congress recognized the inequality of competition for electric utility products some years back by passing the Buy American Act, which prevented government agencies, such as TVA and BPA (among others), from buying foreign equipment unless it was priced at least 6 percent below the lowest bid from a U.S. supplier. For fiscal 1986, Congress raised the differential to 25 percent and for fiscal 1987 to 30 percent. But this applies only to government power agencies and only to extra-high-voltage equipment.

Contracting Parties to GATT in late-1986 agreed to a new round of negotiations, the Uraguay Round, covering another broad range of international trade concerns. The Reagan Administration endorses the agreement and has expressed hopes of getting relief for U.S. electrical manufacturers.

Leveling out the playing field in the competition for world markets for electrical apparatus could go a long way toward restoring vitality to the electrical equipment manufacturing industry after a long, hard uphill battle. It would contribute to our economic recovery against foreign currencies and to domestic security.

The National Electrical Manufacturers Association is working hard to promote the interests of its electrical equipment manufacturing members. But to ensure that the security and health of the U.S. electrical apparatus industry isn't traded away—again, additional support is needed. To our thinking, such support, from EEI, NRECA, APPA and other energy industry organizations, as well as individual utilities and electricity suppliers, could go a long way toward convincing members of Congress to exert pressure to uphold the interests of our domestic equipment manufacturers.

We're writing our representatives in Congress. We hope you, our readers will add your voices also.

*Robert A. Lincicome, Editor*

## Thanks, Duke!

He has been described as the wide-eyed spark plug of this industry, the little bull that brings his own china shop with him, the man with a **Stetson** grin that immediately puts you at ease.

After 27 years with our magazines, and a total 36 years overall in the power generation/electric utility industry, Robert J. "Duke" Kiesel has retired from his position as group publisher of *Electric Light & Power* and *Power Engineering* magazines.

A graduate of Purdue University, Duke spent 9 years of service with Westinghouse prior to joining *Power Engineering* in 1960 as district sales manager in Pittsburgh. In 1973 he was promoted to sales manager of *Power Engineering* and became publisher in 1975. Technical Publishing Company acquired *Electic Light & Power* in 1977 and Duke became Group Publisher of both magazines at that time. In 1982 Technical Publishing, then a company of the Dun & Bradstreet Corporation, elected him Vice President.

Many of you have met Duke through his participation in various industry organization meetings, including the American Power Conference, American Boiler Manufacturers Association, Edison Electric Institute, Electric Utility Fleet Managers Conference, Southeast Electric Excahange, Utility Purchasing Management Group, Valve Manufacturers Association and others. You know not only his humor, but also his genuine interest and concern for this great industry. We will long appreciate his support and his determined effort to promote the electric utility market.

As for me, I'm Art Rice, previously sales manager and, more recently, associate publisher of *Electric Light & Power* and *Power Engineering*. I look forward to working with all of you...and to continuing our magazines' strong commitment to, and involvement in, this dynamic industry.

Much can be said, but a sincere "Thank you, Duke" says it all and says it best.

*Arthur L. Rice, Publisher*

# Letters

### Operating record

In a recent issue of *Electric Light & Power*, you heralded Appalachian Power Company's Mountaineer Plant for setting a world's record for a major steam- electric generating unit running consecutive days. I respectfully submit that this tremendous accomplishment is not truly a world's record.

Commonwealth Edison Co. of Indiana's State Line Unit 1 ran continuously from 8:58 pm December 19, 1929, until 11:13 p.m. June 30, 1952. During this time it generated 26,794,684,288 kWh and burned over 16-million tons of coal before it experienced its first total shutdown.

Unit 1 was rated at 208 MW and used six Babcock & Wilcox pulverized coal stream boilers and a General Electric turbine-generator consisting of two low-pressure and one high-pressure elements, which could operate in a variety of combinations, to achieve this record run. This design permitted individual boiler or turbine elements to be maintained while the others operated.

State Line Unit 1 was retired from service in 1977 and in the same year was designated an ASME National Historic Mechanical Engineering Landmark. For 25 years it was the largest steam-turbine generating unit in the world.

We do not wish to take away any recognition of the excellent performance demonstrated by Mountaineer, but we are equally proud of our Unit 1's record.

*John T. Long, Plant Manager*
*State Line Generating Station*
*Commonwealth Edison Company of Indiana*
*Hammond, IN*

*If our calculations are right, State Line Unit 1 ran for 8,229 days, 2 hours and 15 minutes from startup to first complete shutdown (Including extra days in Leap Years). That's an accomplishment and record that may never be topped!*

### Clinton startup

It is difficult to understand why a utility magazine must take an unwarranted adversarial shot at a member of its own industry. The lead headline and article in your December issue (p.1) on our Clinton nuclear plant had all the negative connotation of a Jane Fonda movie.

It is important to remember that we did finish the plant in less time and for less money than the industry average.

Our startup and testing schedule were completed without a hitch.

Many of your advertisers and oth-

Continued on page 11

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VOICE OF THE ELECTRIC UTILITY INDUSTRY

# PSNH falls, LILCo sways; hit by stalled N-plants

## Seabrook costs topple owner

**Mark T. Hoske**
**Assistant Editor**

MANCHESTER, NH—It's more than a $64,000 question.

Will a bankruptcy-law judge do what a state supreme court and legislators would not—restore Public Service of New Hampshire's financial solvency by raising rates to recoup Seabrook costs prior to operation? No one's sure, but we're going to find out—hearings were scheduled to start in late February.

On Jan. 28, PSNH became the first utility in more than 50 years to file for protection under Chapter 11 of the Federal Bankruptcy Act.

The action came two days after the state supreme court turned down a plea to declare unconstitutional a state law prohibiting recovery of Seabrook costs in rates prior to commercial operation. That would have allowed an emergency $70-million (15-percent) rate increase, the cash PSNH said it needed to avert the filing. The state legislature also turned down requests to change the law.

### What happens to whom

Because of the lack of precedence, it's uncertain what actions the court will pursue over what period of time.

Unsecured debt holders could lose portions or all of their investments, though a majority of creditors must accept any court-approved reorganization. Nuclear opponents plan to use the filing as an argument against Seabrook licensing, though the Nuclear Regulatory Commission said it's not a consideration. And, analysts say, other cash-strapped utilities will watch to see if such a voluntary filing could be an option for their future.

### Protection from creditors

Company officials and some analysts express guarded optimism after the filing, because of the protection offered against the possibility of creditors seizing assets through litigation, after PSNH's default on interest payments.

PSNH's top executive spoke of the action as a part of a bigger picture.

"We'd like to emphasize that our voluntary Chapter 11 filing is but one element of our plan to restore our company's financial integrity," said President and Chief Operating Officer Robert J. Harrison.

Prior to filing, PSNH had numerous discussions on reorganization with major creditors. Now company officials will work with the court to pursue reorganization, but will be allowed to act on ordinary post-petition financial affairs without judicial approval.

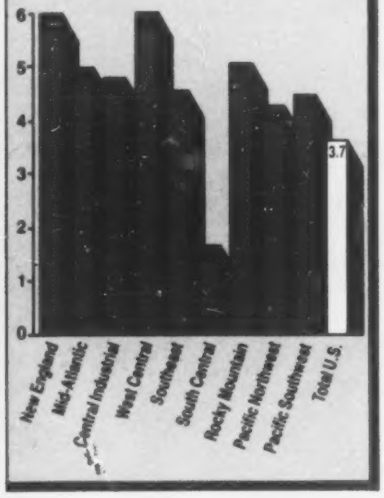
Under Chapter 11, interest payments are not required, subject to the court's discretion. Annual savings on interest payments could amount to in excess of $100 million; prior to filing, the utility had previously defaulted on more than $47 million of such payments.

Although paychecks for the utility's 2600

continued on page 7

## ELECTRICAL OUTPUT

**Here are the increases in electric output for 1987 (from 1986) for the contiguous 48 states and for ten geographical regions, as reported by the Edison Electric Institute. The figures represent percentage increases in net total outputs of investor-, cooperative-, public- and government-owned utilities. Note that the largest increases were in the six New England and the West Central states (6.0 percent), while the smallest increase (1.7 percent) was in the South Central region.**



## Shoreham plan; funds 'OK' till '89

HICKSVILLE, NY—While an NRC board recently gave poor reviews to a 1986 Long Island Lighting Co. Shoreham emergency plan, the state and utility have been discussing power needs for Long Island that may not include the politically stalled plant.

Talks are confidential at this point and described as preliminary, said James Lois, a LILCo spokesperson. Discussions may anticipate a state public service commission stipulation that a rate increase would only be considered if LILCo suggests solutions to the island's energy shortage without the Shoreham plant.

Lois said LILCo will not give up on the $5.2-billion plant, but admits to needing another rate increase. The utility already is collecting $1.8 billion of construction costs in rates, reported Francis Rivett, of the New York Public Service Commission. Despite that, Lois said, after this year, cash runs out for interest payments on debts.

Rivett added that, prior to considering a rate review, LILCo would have to address a number of points, including adding power without Shoreham and improving efficiency in 215 areas.

Meanwhile, Shoreham interest, oper-

continued on page 8

## LATE NEWS

**FERC denied a rehearing** of the case allocating power from the Middle South Utilities Inc. Grand Gulf 1 nuclear unit to four subsidiaries. FERC recently reaffirmed the June 1985 split. Those requesting the rehearing included state regulators and New Orleans.

**Commonwealth Edison Co.,** with $7.1 billion invested in its three latest nuclear plants, is meeting privately to try to negotiate an acceptable rate hike. Illinois regulators have denied a complex rate-hike package; a summer vote on a 27% rate hike is expected. Opponents request a rate decrease.

**A federal judge tossed out** a case by the Wabash Valley Power Association that claimed PS of Indiana violated securities laws by selling WVPA 17% interest in the since-cancelled Marble Hill nuclear project. A suit is pending on a racketeering charge stemming from the long-standing dispute.

**Omaha Public Power District** approved an out-of-court settlement of a lawsuit against the Burlington Northern Railroad on pre-1986 coal delivery rates. The railroad will pay $21.5 million to OPPD in reparation for alleged overcharges. About 25% will go to other Nebraska utilities that shared in the original costs.

## New York buys 1000-MW of firm power from H-Q

NEW YORK—The New York Power Authority and Hydro-Quebec have agreed in principle to a 1000-MW firm-power purchase, starting in 1995. If approved, it would be the largest block the Canadian provincial utility has ever arranged for U.S. usage.

Savings for state utilities, in 1990 dollars, is estimated at $550 million—at least a 10 percent savings over building that generating capacity, explained Stephen Shoenholz of NYPA.

Total revenue for H-Q, in 1990 dollars, is estimated at $3.6 billion. Amounts may change in the first year, according to power plant costs and interest rates. Inflation can adjust the amounts throughout the agreement, said Shoenholz.

The agreement would start in May 1995 with 500 MW and double a year later. Each part would be available for

continued on page 8

## Detroit Edison's Fermi-2 goes commercial

Detroit Edison's $4.57-billion, 1100-MW Fermi-2 nuclear plant began commercial operation in late January, causing an estimated five-year $403-million (14%) rate increase. Another $298-million increase was before the Michigan Public Service Commission, as of press time. DE is protesting $397 million in disallowed costs but will write off about $340 million for Fermi-2 in the first quarter. Anticipating a first-quarter loss, DE is in "the most extensive cost-reduction program in its 80-year history," an executive said. Fermi-2, which will shut down for more tests, expands DE capacity to 9800 MW.

## Coming in April

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# NEWS BRIEFS

## BPA takes steps toward selling WNP 1 and 3

Bonneville Power Association asked for a declaratory judgment lawsuit which could make way for cancellation of the mothballed Washington Public Power Supply System nuclear projects 1 and 3.

BPA administrator Jim Jura wants to ensure that terminating the projects and selling their assets won't lead to default on $3.7 billion in construction bonds, which could require immediate payment and cause an infeasibly large increase in BPA power rates.

After months of review, the BPA asked the Department of Justice to file the suit to clear the way for a future decision. BPA would continue making monthly principal and interest payments if it decided to terminate a project.

Jura stated: "I believe...that continued preservation of the plants [is] the most prudent course of action." However, recent BPA studies show just a 34-percent chance that one of the plants would be needed to meet electric loads of the late 1990s, and just a 16-percent chance that both would be needed.

WNP 3 is 75-percent complete; WNP 1 is 65-percent complete. Bonds are paying maintenance costs of WNP 1. Projected 1988 costs of maintaining WNP 3 is $14.4 and should remain steady in future years, a spokesman said. That's down from $42.2 million in 1986, he said.

## Dominion Resources' firm buys one half of Louisiana hydro plant

Dominion Capital, a subsidiary of Virginia Power's parent company, Dominion Resources, signed a partnership with Catalyst Energy Corp. for the Sidney A. Murray Jr. Hydroelectric Station, a 192-MW facility under construction on the Mississippi River in Louisiana. Dominion Capital Inc. bought half of the $500-million project.

Dale Hopke, a vice president with Dominion Capital, mentioned that the deal was made because of its investment potential and was unrelated to Virginia Power's electric service.

The firms are working with the town of Vidalia, LA, to build the power station in Concordia Parish, LA, 45 miles south of Vidalia and 100 miles northwest of New Orleans. The facility has been under construction since February, 1987, and is 25-percent completed. CE is an independent power producer that owns and leases generation facilities.

Ebasco Contractors Inc. is providing construction services under a fixed-price, fixed-schedule contract. Electricity is to be sold under a 43-year fixed-price agreement to the town of Vidalia and to Louisiana Power & Light Co., a Middle South Utilities Inc. subsidiary.

## Palo Verde-3 becomes operational in record time

According to Arizona Nuclear Power Project (ANPP) officials, Unit 3 of the project's Palo Verde nuclear generating station set an industry record by completing its systems check-out process in 43 days. "It's nice to set a record, but far more important, it underscores the tremendous benefit of standardized plants," stated ANPP Executive Vice President Ed Van Brunt. "Because all three Palo Verde units are identical, we were able to apply to Unit 3 what we had learned on Units 1 and 2," he explained. The Nuclear Regulatory Commission granted a full power license for Palo Verde-3 in late November and, according to ANPP, the unit is expected to operate at full power throughout 1988. Arizona Public Service Company is the managing partner and operator of Palo Verde.

## Kansas utilities want lower-sulfur coal

Kansas City Power & Light Co. and Kansas Gas & Electric Co. have asked for contractual changes with Pittsburg and Midway Coal Mining Co. in order to comply with a new state air quality control requirement.

The petition for declaratory judgment filed at a district court says P&M refuses to reduce deliveries of high-sulfur coal from its Midway Mine to La Cygne Unit 1 except at a penalty price. KCP&L operates the plant and shares ownership equally with Wichita-based KG&E.

The utilities said that recent sulfur dioxide emission tests show that burning only Midway coal would violate hourly monitoring, required starting in May, because of variances in P&M coal characteristics. To make room for lower-sulfur coal, needed for an allowable blend, the utilities want to cut P&M daily delivery from 6500 to 2500 tons.

KCP&L's David Martin said earlier efforts to resolve the matter failed. No hearing schedule had been set as of press time. In the interim, short-term purchases of lower-sulfur coal to blend with P&M coal will be made to comply, Martin said.

## FERC alters split of cancelled cost

Customers and shareholders will now evenly split the cost of abandoned projects that would have been involved in FERC-regulated wholesale transactions, says a new Federal Energy Regulatory Commission policy. The new ruling changes policy that, in some previous cases, had favored shareholders.

The change affects prudently incurred costs of projects that would have been involved in selling power wholesale across state lines—not most state-regulated projects. Utilities under FERC had been able to pass on expenses from cancelled plants to ratepayers over several years, but could not earn a return on the lost investment.

Under the new policy, utilities will be able to earn a return on the portion of expenses the customers pay, but shareholders will have to write off their portion as a loss. Ratepayers will pay their share over the estimated life of the planned plant, eliminating varied periods from case to case.

## NPPD exec says weigh all facts on low-level radwaste storage site

Nebraska Public Power District President and CEO Don Schaufelberger is urging state and local governing bodies and other groups to consider all the information that is available on low-level radioactive waste storage sites, before deciding to oppose the location of one in their area. "Governor Orr has proposed an informational campaign on the issue and Nebraska Public Power District is prepared to make its personnel and resources available to publicly discuss low-level radioactive waste, the type of disposal facility that would be built in the state as well as radiation and nuclear power in general," said Schaufelberger. "An emotional issue of this magnitude can result in widespread misunderstanding if the public does not avail itself to all the information available," he stressed. Schaufelberger expressed concern over the increasing number of county boards and natural resource district boards that are taking action to oppose the site location, after receiving only limited information on the issue.

## DOE names seven sites as 'best qualified' to house Super Collider

Secretary of Energy John S. Herrington has announced that a list of sites for the Superconducting Super Collider has been finalized. The seven sites recommended by the National Academies' of Sciences and Engineering include: Arizona, Colorado, Illinois, Michigan, North Carolina, Tennessee and Texas. Herrington said that a preferred site will be designated in July 1988 and a final site will be announced in January 1989. According to the Department of Energy, the super collider will cost approximately $4.4 billion, with an annual estimated operating budget of $270 million.

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# No increase in '86-7 winter bills, says survey

WASHINGTON—Winter residential electric bills in 1986-87 varied as much as 300 percent regionally, though the average cost per kilowatthour did not increase over the previous winter, according to the ninth winter electric bill survey conducted by the National Association of Regulatory Utility Commissioners.

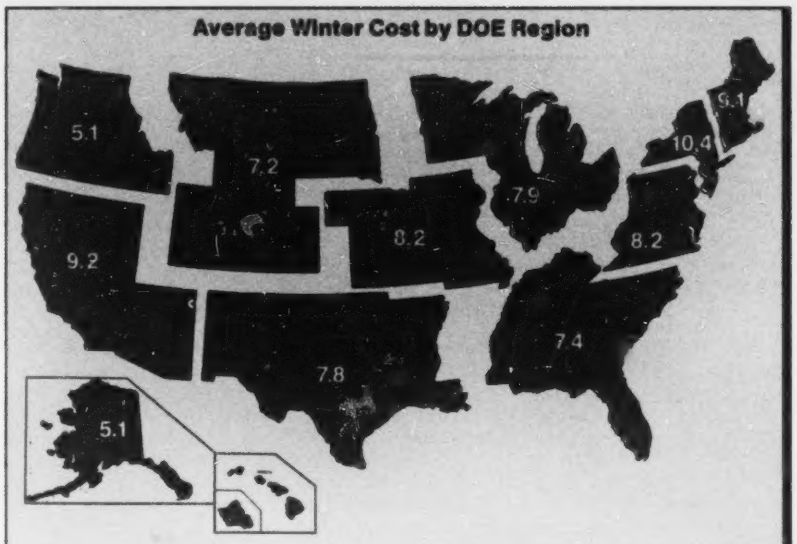
Costs ranged from 4 cents per kWh in Spokane, WA, to 13.1 cents per kWh in New York, and averaged 8.1 cents per kWh nationally. Costs did not change appreciably over 1985-86, despite a 2-percent jump in the Consumer Price Index, NARUC reported.

Service areas in the U.S. Department of Energy's Northeast and Pacific regions were the most expensive, while those in the Northwest and Rocky Mountain regions were the least expensive (see map and charts).

The survey covers bills from December 1986 through February 1987 for 250, 500, and 750 kWh for 191 service territories in 49 states and the District of Columbia. It also covers costs for customers with electric space heating but compiles results only for 500 kWh. Nebraska, which is served only by publicly owned utilities, does not regulate electric rates so is not included.

Copies of the 203-page report are available for $17 from NARUC, P.O. Box 684, Washington, D.C., 20044.

**Average Winter Cost by DOE Region**



| Rank | | DOE Region | Avg. Cost Cents/kwh 500 kwh |
|---|---|---|---|
| 1 | 2 | Northeast | 10.4 |
| 2 | 9 | Pacific | 9.2 |
| 3 | 1 | New England | 9.1 |
| 4 | 3 | Mid-Atlantic | 8.2 |
| 5 | 7 | Central Plain | 8.2 |
| 6 | 5 | Mid-West | 7.9 |
| 7 | 6 | Southwest | 7.8 |
| 8 | 4 | Southern | 7.4 |
| 9 | 8 | Rocky Mountain | 7.2 |
| 10 | 10 | Northwest | 5.1 |
| | | National Average | 8.1 |

NARUC 1986-87 Winter Survey Of Residential Electric Bills

**Ten Most Expensive Service Territories**
(Continental U.S.)

| Company | State | Total Bill | Avg. Cost Cents/kwh 500 kwh | Rank |
|---|---|---|---|---|
| Consolidated Edison Co. Of N.Y. | New York | $195.91 | $0.131 | 1 |
| San Diego Gas & Electric | California | $179.91 | $0.120 | 2 |
| Long Island Lighting | New York | $177.56 | $0.118 | 3 |
| Philadelphia Electric | Pennsylvania | $175.87 | $0.117 | 4 |
| Orange & Rockland Utilities | New York | $168.77 | $0.113 | 5 |
| Texas-New Mexico Power | New Mexico | $167.33 | $0.112 | 6 |
| Central Vermont Public Service | Vermont | $166.80 | $0.111 | 7 |
| Delmarva Power & Light | Virginia | $164.82 | $0.110 | 8 |
| Public Service Elec. & Gas | New Jersey | $162.36 | $0.108 | 9 |
| Northern Indiana Pub. Service | Indiana | $162.09 | $0.108 | 10 |

**Ten Least Expensive Service Territories**
(Continental U.S.)

| Company | State | Total Bill | Avg. Cost Cents/kwh 500 kwh | Rank |
|---|---|---|---|---|
| Washington Water Power | Washington | $ 59.97 | $0.040 | 191 |
| Washington Water Power | Idaho | $ 62.73 | $0.042 | 190 |
| Idaho Power | Idaho | $ 63.17 | $0.042 | 189 |
| CP National Corp. | Oregon | $ 65.85 | $0.044 | 188 |
| Pacific Power & Light | Washington | $ 67.95 | $0.045 | 187 |
| Idaho Power | Oregon | $ 71.34 | $0.048 | 186 |
| Portland General Elec. | Oregon | $ 72.84 | $0.049 | 185 |
| Pacific Power & Light | Montana | $ 73.32 | $0.049 | 184 |
| Puget Sound Power & Light | Washington | $ 75.74 | $0.050 | 183 |
| Minnesota Power & Light | Minnesota | $ 79.48 | $0.053 | 182 |

Source: NARUC 1986-87 Winter Survey Of Residential Electric Bills

# Pilgrim outage; charges mount

CAMBRIDGE, MA—Boston Edison Co.'s 678-MW Pilgrim plant, shut down since April 1986, has left several neighboring utilities to buy power elsewhere, sparking charges of BE imprudence and legal action.

BE denies the charges and, as of press time, planned to have the plant ready for operation by early March, but may have to wait until May or longer for an NRC go-ahead.

Total cost for replacement power has surpassed $170 million, according to BE's $250,000-a-day estimation.

Commonwealth Electric Co., which has a contract to buy 70 MW (11 percent) of Pilgrim's power, filed a petition with the Federal Energy Regulatory Commission, asking for a full investigation, saying BE has failed to manage the plant prudently and diligently in this and prior shutdowns.

## Demands outlined

CEC also asked for a refund of unjustified contract-related charges and payment of additional costs for replacement power, permission to terminate the contract, or an order that the contract be changed to protect CEC and its customers in the future, explained Russell D. Wright, financial vice president of CEC's parent, Commonwealth Energy System. CEC filed similar complaints with the U.S. Federal Court for the District of Massachusetts, he said.

In a counterfiling with FERC, BE de-

continued on page 7

# NRC gets Peach Bottom plan; president quits after INPO audit

PHILADELPHIA—Philadelphia Electric Co. delivered the second half of its nuclear reorganization plan to the NRC in mid-February and hopes to reopen its Peach Bottom nuclear plant by this summer. The 886-MW nuclear plant has been closed a year.

Until Peach Bottom restarts, Corbin A. McNeill Jr., senior vice president nuclear with Public Service Electric & Gas Co., has been loaned to PE to fill the newly created position, executive director of nuclear. Like plant operator PE, PSE&G owns 42.5 percent of Peach Bottom. Delmarva Power & Light Co. and Atlantic Electric Co. each own 7.5 percent.

Partly in response to a scathing Institute of Nuclear Power Operations review of management actions concerning the Peach Bottom shutdown, John H. Austin Jr., with PE for 38 years, resigned.

PE's Bill Jones said a national search has commenced for a new president with strong nuclear experience. James L. Everett III, PE's chairman and chief executive officer, is filling the position in the interim.

State regulators, handing PE a $37 million rate cut, called for Everett's resignation. As of press time, PE had not officially responded.

After shutdown, the utility was criticized strongly by the Nuclear Regulatory Commission about Peach Bottom and management.

## INPO downgrades PE efforts

Following its review, INPO said PE's initial reorganization accomplished little. Submitted in September, it restructured the chain of command to emphasize nuclear operations and was later approved by the NRC (*EL&P*, Nov. 1987, p.43).

## Report's effect

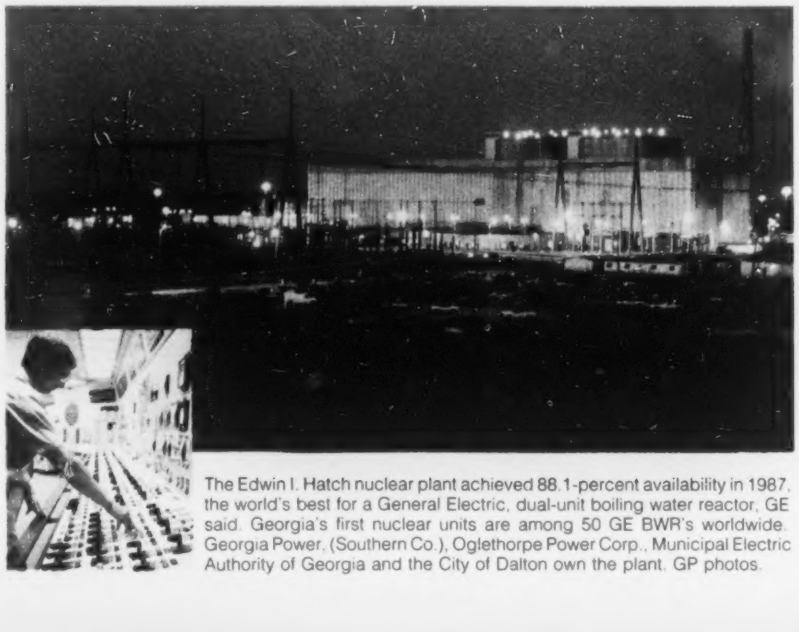
An NRC spokesperson for PE's region reported that he was unsure how INPO's recent report would affect the NRC's evaluation of the Peach Bottom restart plan.

Jones said this plan, the second half of PE's reorganization, would improve Peach Bottom training, company communications, and accountability. These were among INPO's main concerns.

## Replacement power cost

The Peach Bottom shutdown has cost PE more than $58 million in replacement power so far. The plant was shut down in March 1987 after the NRC learned that operators had napped in the plant's control room. Later concerns about PE management were revealed.

# Georgia Power's Hatch Plant sets record



The Edwin I. Hatch nuclear plant achieved 88.1-percent availability in 1987, the world's best for a General Electric, dual-unit boiling water reactor, GE said. Georgia's first nuclear units are among 50 GE BWR's worldwide. Georgia Power, (Southern Co.), Oglethorpe Power Corp., Municipal Electric Authority of Georgia and the City of Dalton own the plant. GP photos.

# COMMENTARY

## Keep PSNH problems in proper perspective

**It would be wrong to try to minimize the seriousness of the problems confronting Public Service Company of New Hampshire. It also would be equally improper not to keep that company's difficulties in proper perspective.**

**Obviously, when a utility is forced to seek Chapter 11 bankruptcy protection, it's a serious problem. But it's the problem of just one utility, and not a typical utility even then. It is not an industry problem and doesn't suggest troubles for other utilities, not even nuclear utilities.**

**PSNH got into its financial difficulties because of two things: the Seabrook Nuclear Plant and company management's refusal to abandon it when skyrocketing costs outran the company's abilities to fund them. PSNH assets still exceed liabilities by more than $1-billion. It just can't generate enough cash to service its Seabrook debt. But unless the NRC grants Seabrook its operating license without an official emergency plan submitted by the Commonwealth of Massachusetts, that may never occur.**

**The bankruptcy action will provide the utility with time in which to work out solutions to its other problems. Service to customers will continue. Employees will continue to be paid. If interest payments are suspended, as typically done, the company will improve its cash flow by more than $100-million per year.**

**However, a number of difficult questions must be answered. Will the bankruptcy court judge be able to establish needed higher rates for the utility? If the court should try, how will the state utility commission, which is specifically charged with rate regulation, respond? Should the court defer to the state commission to direct an increase, would the commission set rates high enough to allow the utility to earn a fair rate of return? And how will shareholders respond to the probability that creditors will be granted major controlling interest in the company?**

**There is no question the next few years will be difficult for PSNH personnel and others related to the company. But it's vital to keep those troubles in perspective.**

## Challenges face co-ops

**After a lapse of more than a decade, this editor again was privileged to cover the Annual Meeting of the National Rural Electric Cooperative Association held in New Orleans last month. The 46th annual gathering of co-op managers and directors was a smoothly organized, well-run business meeting that focused heavily on the economic and technical changes facing co-ops and the electric industry at-large. It was interesting and valuable, but with few of the histrionics and verbal pyrotechnics of earlier years.**

**Back in the 60s and 70s, NRECA General Manager Clyde Ellis and strings of rural representatives from Congress sizzled the air with charges against investor-owned utilities and conservative administrations, waving the flag for country, family-based social values, the rural life and the co-op spirit that brought people together to do for themselves what big business couldn't or wouldn't do. Those were meetings replete with oratory, the kind of stem-winding invocations against big business and the IOUs that brought crowds to their feet and filled the halls with cheers and jeers.**

**This year, however, there was little of the hoopla and verbal fireworks of those earlier days. Instead, presentations focused on the specific needs of small electric systems, as represented by co-ops, and how developments in the society and economy will impact those small systems. Subjects like how rural America can adapt to the high-tech, high-flex society, deregulation, building load, pricing and management competence drew large audiences and lively questioning. Appeals were far more to the intellect than to emotion.**

**Another difference was that registrants seemed older and talked and acted more conservatively, despite the influence of the French Quarter, than I recall from earlier meetings. But maybe that's because I'm older and more conservative (yes, even with the French Quarter right around the corner), and tend to recognize those characteristics in others.**

**In any case, it was a thought-provoking three-day session, providing the kinds of information and background needed for intelligent decision-making in the months and years ahead... more useful than those I recall from the past.**

**But I did miss the excitement.**

*Robert A. Lincicome, Editor-in-Chief*

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# LETTERS

### Reader response to EL&P letter

A copy of the following letter was sent to *EL&P* as a followup to a letter about FCB testing written last spring by the head of the PCB disposal section at EPA and published in *Electric Light & Power*.

Dr. John H. Smith, Chief
PCB Disposal Section
U.S. Environmental Protection Agency
Washington, DC 20460

Dear Dr. Smith,

Earlier this year I recall seeing your letter (on PCB testing) in *Electric Light & Power* (March 1987, p.3).

Let me tell you a story.

A few years ago, a college student working part-time at a utility was told to clean up a PCB spill.

Despite published company procedures, providing for the use of clean-up gloves, etc., he was given nothing, nor was he told about the potential carcinogen exposure.

In fact the clothing he wore that day, including his boots, which were saturated with PCB-contaminated oil, was worn home.

When he learned about PCBs, he contacted the utility company, in writing, asking for more information. He was told, in a letter prepared for [a company executive's] signature by [the company's] outside law firm, that he need not worry, since his exposure level was less than 150 ppm.

In fact, the exposure level reported by the utility to EPA for this spill was more than 8500 ppm.

Inquiries to EPA resulted in suggestions that the state's Water Control Board be contacted. They, in turn, suggested that it wasn't in their area and that he contact the state Attorney General's office.

The Attorney General advised that while the employee had been lied to, the company had not lied to EPA, hence there was nothing that could be done.

A classic study of bureaucracy. Let me assure you that the very top management of this "respected" utility were made aware of this. So, while the young man waits...and wonders...the criminals, (and in my opinion no other word fits better) go free.

I know about this matter since the young man involved is my son.

*Cary Cohen*
*Caldwell Consulting Associates*
*Richmond, VA*

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### LTC selection

It is noted in the article "Evaluation method can ease LTC selection," (October 1987, p.30) that the arguments presented are those of a representative of ASEA Electric. I cannot fault him for promoting any features of his client's product. However, as an engineering manager with a producer of a family of tapchangers based on the reactance bridging-in-oil concept used by several OEM of LTC transformers, I must challenge or expand on several points.

First, to clarify, the article shows a tapchanger identified as the Siemens TL3, rated at 1200 amperes. Neither of these is correct. I believe the article is referring to our TLH-21 tapchanger, rated at 1300 amperes.

Regarding inspection costs, the article assesses the expense of two inspections per year to reactance/oil tapchangers. Siemens literature recommends only that the *first* inspection be made at 6 months or 50,000 operations, whichever comes first. Based on the observations of that check, our literature suggests that "two or three years may be allowed" until the next check of the mechanism. It also should be recognized that the frequency of checks is more a function of operation count than of elapsed time. With only 5500 operations planned per year, the user will very soon find that even a three-year interval of inspections is unnecessary.

Also in the context of inspection costs, why is it that the present value[s] of costs are shown in the article to remain unchanged by year?

Regarding the number of tapchanger operations between contact replacement, the article indicates contact replacement on the Siemens tapchanger at intervals of 55,000 operations. While we have been reluctant to state a specific life for the contacts, our literature does state "typical values of arcing contact life range from 100,000 to 1,000,000 load tapchanging operations." Consequently, the article indicates three changers in the 165,000 operation (30-year) period, when our *most conservative* estimate would indicate only one change would be required.

Our hesitation to be more definitive regarding guaranteed operations stems from the variability in operating conditions to which the tapchanger would be subjected. For example, if the tapchanger is operated nominally at 800 a. instead of the rated 1300 a., the life expectance is raised about 84 percent; if the system load power factor is 0.95 lagging instead of the basis 0.80 lagging, the life expectance is raised about 13 percent. Additionally, the transformer manufacturer can design the tap voltage and bridging reactor exciting current to affect the contact life.

Regarding transformer no-load losses, the article at one point states that the dollar value of losses will not be treated in the study, yet later makes a specific negative comment regarding LTC preventive autotransformer core losses. This section reads as though there is something particularly detrimental about losses associated with the PA. Of course, when losses are quoted for the transformer they include the contribution of the PA.

Ironically, it is the question of transformer losses that often makes the most telling point when countering the claims of ASEA. Since the ASEA tapchanger is rated for a through current of only 600 a., a transformer rated higher that 600 a. would include a supplemental series transformer.

The user must be made aware of how no-load losses are greatly affected by tap position when a series transformer is used. No-load losses are frequently quoted at the neutral tap position, where the series transformer contributes nothing to to the no-load loss. In order to perform a realistic loss evaluation, the losses must be known at other tap positions. It is for this reason that the following statement has been added to an IEEE Guide for loss evaluation presently being developed.

*The losses in Load Tap Changing (LTC) transformers may vary with the LTC position. In addition, at any given position, the losses may vary with different configurations of LTC equipment, such as tap winding location, the presence of series transformers, preventive auto transformers, etc. The user should consider these variations when comparing two or more offerings.*

The points that I have raised relate directly to the tapchanger and its application. Very likely, the transformer manufacturers will have additional comments.

*James H. Harlow*
*Manager, Engineering*
*Siemens Energy & Automation, Inc.*
*Regulator Business Unit*
*Jackson, MS*

4/20/88

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APRIL 1988

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## LATE NEWS

**FERC has proposed** three rulemakings related to PURPA. The rulemaking on avoided cost has a comment period of 60 days. Those on competitive bidding and IPPs have 90-day comment periods. A public conference is set for 110 days and reply comments for all three must be submitted within 120 days. See stories below and on page 11.

**Virginia Power Co.** announced reorganization of power operations, construction, engineering and technical support programs, resulting in elimination of 100 salaried positions in a transition toward acquiring more outside generation. See story, page 3.

**A new communications network** now links the 43 upper Midwest utilities in the Mid-Continent Area Power Pool. Designed and installed by Digital Equipment Co., the network also is connected to power pools to the south.

# FERC poses 'fine tuning' to increase competition

**Mark T. Hoske**
**Assistant Editor**

WASHINGTON—The Federal Energy Regulatory Commission proposed three rulemakings intended to increase competition for non-utility power production under PURPA, on March 16. Interested parties will have from 60 to 120 days to file comments before the commission votes on the measures.

Summary drafts of three notices of proposed rulemakings—on administrative avoided cost, competitive bidding and independent power producers—were made available at a Feb. 17 commission meeting, but interested parties have filed about 11,000 pages of testimony on possible PURPA revisions since 1985. (See related story, page 11.)

FERC Chairwoman Martha Hesse described the drafts of the proposed rulemakings as "fine tuning" the Public Utility Regulatory Policies Act of 1978. FERC hopes to create a more competitive and consistent regulatory framework of policies for the states to apply concerning non-utility generators, she has said.

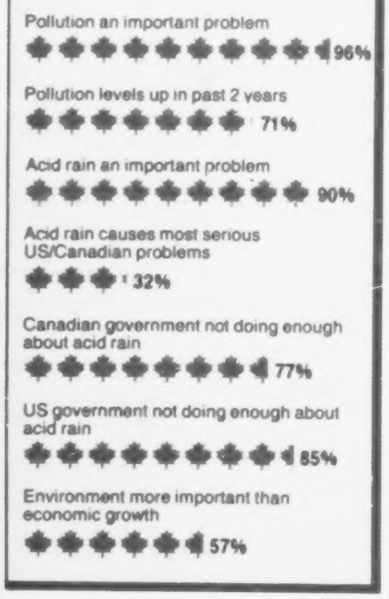
The National Association of Regulatory Utility Commissioners took exception to the FERC drafts on March 2 at their winter committee meeting. The executive committee voted 21-0 to approve a resolution recommending, in part, that FERC terminate proposed rulemaking on competitive bidding or independent power producers and instead proceed with rulemaking on transmission regulations.

NARUC also asked that FERC allow a 120-day comment period to give interested parties time to develop responses and participate in the rulemaking proceedings. In addition to the 120 days, 30 more days should be allowed to file replies, with regional hearings on the proposals after that. FERC had said a 60-day reply period was being consid-

Continued on page 12

## CANADIAN ATTITUDES

Canadian citizens are getting impatient with both the U.S. and their own federal governments when it comes to actions to reduce acid rain, according to a poll conducted by a Toronto public opinion polling company. Environics Research conducted a poll in late '87 for the Canadian Electrical Association that also indicated the citizens' concern over nuclear power—nearly two-thirds of the 2000 surveyed opposed construction of new nuclear power stations. Their attitudes about pollution are displayed below.



## States study least-cost plans to aid cost-effective spending

WASHINGTON—Least-cost planning seems to be a hot topic, however one defines it.

From January 1986 to June 1987:

- 23 state regulatory commissions were examining or initiating policy,
- 12 state legislatures introduced or passed legislation,
- and six states have released studies about least-cost planning, according to a recent study from the Energy Conservation Coalition, affiliated with Environmental Action Foundation.

The 85-page report, "A Brighter Future: State Actions In Least-Cost Electrical Planning," is largely a documented, state-by-state review of those actions, but also includes a summary of the findings, an analysis of issues and appendix of contacts.

"Interest in least-cost planning among citizens, regulators and utilities is piqued because of rising electricity costs, increase small power production and the financial difficulties facing many nuclear power plants," according to Paul Markowitz, the ECC state field coordinator.

The ECC report defines least-cost strategy as a "mix of demand-side (energy efficiency and load management) and supply-side (small power sources and new generating facilities) resources it provide reliable ctricity at the low- possible cost to lities and their rate- ers."

'urther, least-cost planning assures that the cost-effective potential for all resources is assessed, and that resources are ranked accord-

Continued on page 12

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## Regulators, utilities seek DOE waste fund payments

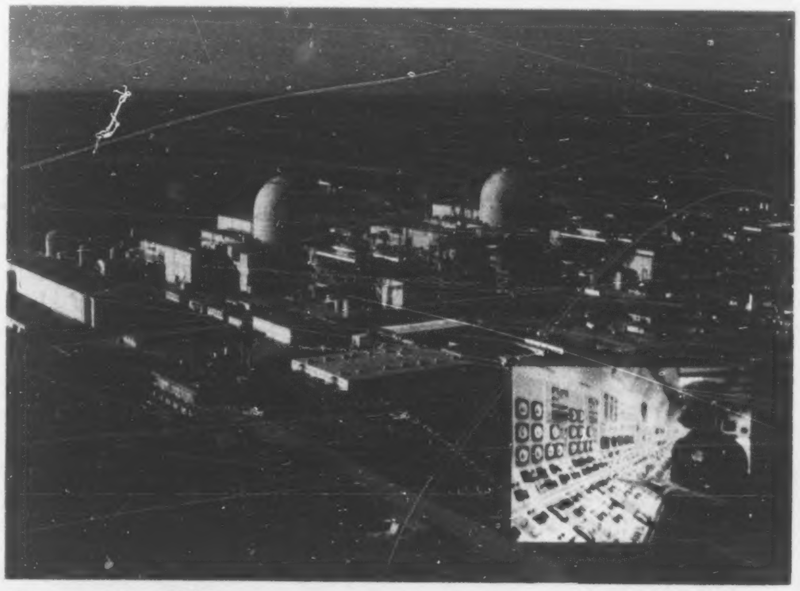
WASHINGTON—State regulators and nuclear utilities in February filed briefs with the U.S. Court of Appeals, continuing litigation over the U.S. Department of Energy's non-payment into the Nuclear Waste Fund. Oral arguments are scheduled for May 13.

Utilities and ratepayers have contributed $3.4 billion of the estimated $30 billion required for developing and operating high-level nuclear waste storage facilities.

The National Association of Regulatory Utility Commissioners (NARUC) and a group of 41 nuclear-plant owners contend that statutes require firm, fixed rules on payment schedules and the method of allocation. DOE has devised a method of payment into the fund which would treat common costs of civilian and defense nuclear waste storage in a variable way, explained Charles D. Gray, assistant general counsel for NARUC.

NARUC and the utilities say those

Continued on page 10



## South Texas to feed HL&P grid

Houston Lighting & Power hoped to get Unit 1 of its South Texas Project into full operation before this issue of *EL&P* reached readers. At press time, NRC investigators said alleged safety violations were not serious enough to delay a vote on full-power licensing. At left and in the background, a 7000-acre, man-made reservoir will provide cooling for the nuclear units. Unit 2 is 90-percent completed. HL&P operates and is 30.8-percent owner of the $5.3-billion, 2500-MW facility. Other owners are Central Power & Light Co. (25.2 percent) and municipal utilities of Austin and San Antonio. (See story, page 6.)

# NEWS BRIEFS

JILL MINNER, Assistant Editor

## TU Electric to purchase TMPA's share of Comanche Peak plant

Texas Utilities Co.'s principal subsidiary, Texas Utilities Electric Co., has agreed to buy Texas Municipal Power Agency's (TMPA) 6.2 percent share of the Comanche Peak nuclear power plant for $456 million. TU Electric also agreed to settle pending litigation, started in May 1986, between TMPA and the minority owners of Comanche Peak. Under the agreement, which is still subject to regulatory approval, TU Electric will make a series of installment purchases over the next five years for: TMPA's share of Comanche Peak, nuclear fuel, transmission facilities, and legal and other expenses related to the litigation.

## Savannah shareholders approve acquisition by Southern Company

The acquisition of Savannah Electric and Power Co. by The Southern Co. was recently approved by Savannah Electric's shareholders. The utility will operate as an independent subsidiary of Southern Co. and will continue to be headquartered in Savannah, GA.

## Ohio Transformer buys transformer repair business from Siemens

Ohio Transformer Corp. has purchased Siemens Energy and Automation's power transformer repair business. "We were looking for an opportunity to increase our market share as well as improve our already high performance level. The Siemens plant offers us state-of-the-art equipment and designs, a broadened customer base, and a quality, skilled workforce which will help us accomplish this goal," explained Ohio Transformer President Walter Wojack. The company said it will keep the facility at its present location and will take over operations immediately.

## Dominion announces intent to buy one half of Enron Cogeneration

Dominion Energy, Inc., a subsidiary of Dominion Resources, Inc., has announced that it plans to buy one half of Enron Cogeneration Company. According to Enron Corp., the preliminary purchase price is $90 million. Enron Cogeneration reportedly has interests in three gas-fired cogeneration facilities totalling 915 MW.

## PP&L plans to sell bulk power to BG&E

Pennsylvania Power & Light Co. (PP&L) has agreed to sell 125 MW of power to Baltimore Gas and Electric Co. for a 10-year period beginning in 1991. Under the contract, PP&L will sell 6.6 percent of the output from its share of the Susquehanna nuclear power plant. PP&L is currently selling that power to Atlantic Electric under an agreement which expires on Sept.30, 1991.

## PG&E, TID submit power sales agreement for FERC approval

The Federal Energy Regulatory Commission (FERC) has been asked to approve a 20-year interconnection and power sales agreement between Pacific Gas and Electric Co. (PG&E) and the Turlock Irrigation District (TID) in San Francisco. Under the agreement, TID would have access to alternative power suppliers but would be required to purchase two percent of its electricity needs from PG&E over the next 20 years. "This contract responds to FERC's efforts to increase competition and decrease regulation in bulk power markets, by building market-based pricing into every coordination transaction," said Robert J. Haywood, PG&E vice president of power contracts.

## Ferranti International, China contract for EMS

Ferranti International Controls Corp. has signed a $5-million contract with the Guangdong General Power Co. (GGPC) of the People's Republic of China for the supply of a Ranger Energy Management System in GGPC's service area. According to Ferranti, GGPC provides service to 60 million people in an area of Southern China near Hong Kong. The company has scheduled delivery of the system for mid-1989.

## DOE asks for clean coal technology proposals

As part of its *Innovative Clean Coal Technology Program*, the Department of Energy is requesting proposals for clean coal technology projects. DOE said it will provide $536 million in funding to demonstrate the new technologies, but that private proposers must be willing to finance at least half the costs of the design, construction and initial operation of the demonstration facility. Proposals are due by May 23, 1988 and selection of the projects will take place in the early fall, according to DOE. Copies of the formal call for proposals, contained in DOE's *Program Opportunity Notice*, can be obtained by writing DOE at P.O. Box 2500, Attn: Document Control Specialist, MA-451.1, Washington, DC 20013.

## Bechtel, BNFL join for nuclear fuel cycle work

Bechtel Limited (BL) and British Nuclear Fuels plc. (BNFL) have entered into a protocol agreement to work together on nuclear fuel cycle programs. "I believe that this association is an ideal combination of BNFL's expertise in the development, design, construction and operation of nuclear fuel facilities with Bechtel's wide-ranging engineering experience," stated Bill Wilkinson, BNFL's Deputy Chief Executive and Director of Engineering. The 15-year agreement calls for both companies to provide their skills and experience, while still allowing each firm to carry out its own marketing programs. "This landmark agreement combines the strongest, most diverse experience available in nuclear fuel cycle work," said BL Managing Director Ken Turnbull. London-based BL is a Bechtel operating company and will be assisted in its work by Bechtel National, Inc. of San Francisco.

## Paquette to succeed Everett as head of Philadelphia Electric

Philadelphia Electric Co. has named Joseph F. Paquette, Jr. to succeed James Lee Everett III who has resigned as chairman. Paquette will leave his position as president of CMS Energy Corp. to help Philadelphia Electric deal with its troubled Peach Bottom nuclear plant, according to the utility. In addition, S. Kinnie Smith, Jr., currently vice chairman of CMS Energy Corp., will replace Paquette as president.

## Niagara Mohawk names Endries president; Donlon chairman/CEO

Niagara Mohawk Power Corp. has announced that on June 1, William J. Donlon will succeed the retiring John G. Haehl, Jr. as chairman and CEO of the company. Donlon is currently president of Niagara Mohawk. Also on June 1, Niagara Mohawk Executive Vice President John M. Endries will become president. "We have taken all of the necessary actions to ensure an orderly management transition," noted Haehl. "In November, we announced a corporate restructuring and a new management team. My retirement and the elections of Bill Donlon and Jack Endries are the final steps in this transition," he added.

## White, Katlic to head AEP coal companies

W.S. White, Jr. was named chairman and John E. Katlic was appointed president of American Electric Power Co.'s 11 coal companies. White, formerly president, will continue to serve as CEO. Katlic, who had been executive vice president, will carry on his responsibilities as chief operating officer of the companies.

## Lee wins Gantt Medal

The American Management Association (AMA) and The American Society of Mechanical Engineers have named William S. Lee III as recipient of the 1987 Henry Laurence Gantt Medal. AMA said that Lee, who is Chairman and CEO of Duke Power Co., was chosen for his "distinguished achievement in management as a service to the community." The annual award will be presented this month at AMA's Human Resources Conference and Exposition in Chicago.

## EPRI High Sulfur Test Center receives award

The High Sulfur Test Center (HSTC) has been selected as one of 1987's six outstanding engineering achievements by the National Society of Professional Engineers (NSPE). The HSTC, designed and managed by the Electric Power Research Institute, received the honor for "achievements that will contribute to public safety and welfare, provide the basis for future technological developments and contribute to our technological competitiveness," according to NSPE. "The goal of the 10-year, $65-million HSTC test and development program is to cut the cost of emission control by 50 percent, increase air-pollution control equipment reliability and develop methods that can convert the emissions into useful byproducts, such as gypsum wallboard or elemental sulfur," explained Kurt Yeager, EPRI vice president and director of the coal combustion systems division.

## Generation growth will slow in '88, says EIA

In its *Short-Term Energy Outlook*, the Energy Information Administration (EIA) predicts that U.S. electricity generation growth will slow to about one percent between 1987 and 1988, due to slower industrial output and a return to normal weather. The administration reported that in 1987, a combination of relatively high growth in industrial output and a warm summer increased electricity generation from the previous year by three percent. EIA also projects that U.S. petroleum demand will increase for the third straight year.

## Ohio electricity sales were up in 1987: OEUI

The Ohio Electric Utility Institute (OEUI) has reported that Ohio's electricity sales in 1987 increased by 5.2 percent. Industrial sales rose an average 6.6 percent and residential and commercial sales each showed a 3.9 percent increase. "This is clear evidence of Ohio's continued economic expansion as well as a reminder of the importance of anticipating our customers' electricity needs as we approach the 1990's," stated OEUI Executive Vice President Gerald M. Minnery. OEUI is the association of Ohio's eight investor-owned electric utilities.

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# Virginia Power requests bids for 1750 MW

RICHMOND, VA—Virginia Power Co. is seeking bids of up to 1750 MW from outside generators of electricity, underscoring its commitment to use the bulk power market instead of building its own new generation.

"We believe that this will be the largest block of capacity yet purchased by a utility under competitive bidding," said Jack H. Ferguson, president and CEO of Virginia Power.

### More planned

In addition, the utility announced plans to buy 5800 MW—30 percent of its generation—from outside sources by the year 2000.

These competitive purchases follow a January order by state regulators that encourages competitive bidding under PURPA and Federal Energy Regulatory Commission guidelines.

VP's bidding system and contracts are subject to review by state regulators and the utility reserves the option to reduce the amounts. Bids from independent power producers, cogenerators, small power producers and neighboring utilities will be evaluated on the basis of price and non-price factors. Contracts are to be awarded in October.

The need for new generation is a result of a growing sales base. Virginia's solid economic expansion and increased usage brought on by sharp declines in the company's electric rates relative to inflation, Ferguson explained.

By 1994, 2782 MW will be needed to keep pace with projected demand, VP said. More than 90 percent—2526 MW—is expected to come from non-company sources.

### A departure

This is an obvious departure from previous utility tradition of building new generation capacity.

"Times have changed," Ferguson stated. "Economies of scale have vanished, and building new units has become expensive and risky. Changing economic and regulatory conditions have pushed utilities toward units with shorter lead times and smaller sizes."

The power is to be added over five years in seven varied amounts, starting with 150 MW in 1989.

# PSNH assets for sale? LILCo talks go on

BARRINGTON—Managements of three northeastern utility companies beleaguered by nuclear plant problems continue to seek solutions, with varied results to report during late February and March.

Public Service of New Hampshire, Boston Edison and Long Island Lighting all face questionable futures as a result of their inabilities to get their respective nuclear plants into operation.

New England Electric System (a 10-percent Seabrook owner) is holding preliminary discussions with PSNH to acquire that utility's operating assets, excluding PSNH's 35.6-percent Seabrook stake.

Sales of these assets would help PSNH pay off its debts, but the bankruptcy court would have to approve, in addition to the usual state and federal approvals. Current market value of PSNH is $2.95 billion, or $1.15 billion without its $1.8-billion Seabrook investment.

Leaders in both utilities expressed optimism about the talks, though none would offer specific details. Observers suggest that the physical relationship of the two companies may favor merger action. NEES transmission lines traverse PSNH territory, and the utilities share a common border between Massachusetts and New Hampshire.

By the end of May, 120 days after filing for Chapter 11 bankruptcy, Public Service of New Hampshire must have a reorganization plan completed for the court. No details on that plan yet are available. A company spokesperson said extensions may be sought.

### Boston Edison's Pilgrim

Boston Edison Co. plans to complete its self-assessment for restart of the 678-MW Pilgrim nuclear plant by the end of March. The assessment is to address various NRC concerns raised since the company's restart plan was submitted in July 1987. A final NRC go-ahead may take till May, or longer.

A BE spokesperson said a $165-million investment has been made in modifications, maintenance, and fuel loading for the plant, which was shut down in April 1986. However, an outside source pointed out that the company's cash flow problems had resulted in severe cutbacks in personnel and work levels aimed at correcting the plant's problems and could further delay NRC action.

Replacement power has cost about $178 million, an estimated $250,000 per day.

Modifications include:

- Adding a hydrogen chemistry system to improve steam water quality in order to reduce stress and corrosion cracking in piping joints.
- Replacing containment building spray headers to lower the flow rate and improve cooling capacity.
- Installing a third diesel generator for safety system backup power, exceeding NRC requirements. A second diesel fire water pump was added and security barriers were improved.
- About 80 percent of the plant now is radioactively "clean," up from 46 percent at shut down.

### Power needed in New England

"New England needs new electricity generating capacity, including the Seabrook nuclear plant," says Samuel Huntington, president and CEO of NEES and chairman of New England Power Pool's executive committee.

The strong New England economy fueled a sharp 5.3-percent increase in total electricity use for 1987, which contributed to regional electricity shortages last summer and this winter, he explained.

Huntington cautioned against what he called "the triple threat"—Seabrook not receiving an operating license, the shutdown of nuclear facilities in Massachusetts, and any delay in completion of the second phase of the Hydro-Quebec transmission project scheduled for late 1990. These amount to almost

Continued on page 17

# Rancho Seco fate unclear; SMUD voters to decide

SACRAMENTO, CA—Voters of the Sacramento Municipal Utility District will choose the fate of Rancho Seco, the board of directors decided, after it received conflicting advice from two panels on whether or not the troubled nuclear unit should operate, and if so, under what conditions.

More than $430 million has gone into plant restart since the December 1985 emergency shutdown. Before this issue of *EL&P* reaches its readers, the Nuclear Regulatory Commission was scheduled to vote on Rancho Seco's restart.

### Referendum slated

Plant opponents have placed an item on the June ballot for voters to choose between continued operation or closing the plant. But the SMUD board decided to pose a referendum that would place strict guidelines on plant operations, including an option for voters to close the plant at refueling—18 months after full-power operation has begun.

The utility's general manager, Richard K. Byrne, and an appointed advisory panel, dubbed the Quest Team, concurred that the plant is too risky to operate and should be closed.

Another appointed advisory board made up of judges and statesmen, conducted separate hearings and unanimously recommended restart. Community leaders have expressed mixed views and public opinion polls are about even.

Recommendations from Byrne and the Quest Team include:

- Close Rancho Seco.
- Raise rates by 7 percent to pay for decomissioning and replacement power.
- Develop a program to assist the 600 to 700 people out of about 900 at the plant who would out of work.
- Arrange for a bond issue or other financing to fund those moves.
- Continue to negotiate with Pacific Gas & Electric and Southern California Edison for purchase of replacement power.
- Implement aggressive load management and conservation steps.
- Hold the April and May 1988 budgets to those of 1987.

The second advisory panel said, however, that there is no question that the plant is safe, and that operation, given the investment already made toward restart, is the choice most beneficial for economy and ratepayers.

### Voters' option

The choice outlined in the board's referendum would place a number of restrictions on operation:

- Operate Ranco Seco for 18 months, while pursuing options for divestiture.
- Strive for 70-percent availability after full-power operation is acheived.
- If operation falls below 50-percent for four successive months, the plant would close. The board could only keep the plant operating by a four-to-one vote. The board may close the plant by four-fifths vote prior to the first refueling.
- Performance would be evaluated every six months by an outside consultant.

Continued on page 10

# 1987 electric utility financings fell 33 percent, says consulting firm

NEW YORK—Financings by all types of utilities fell 43 percent in 1987 from the previous year. Electric company financings, including the sale of bonds, preferred stock and common shares, dropped 33 percent. Gas financings were down only 8 percent, according to Ebasco Business Consulting Co.

The firm's tabulation showed total 1987 financings of $21.1 billion, down from 37.2 billion in 1986. Moreover, in 1986, electric utilities *alone* raised $23.7 billion, surpassing the 1987 combined total raised by *all* types of utilities.

Most of the financings were public in nature and were sold on a negotiated basis. About two-thirds of the amount was new money and the balance for refunding purposes.

Largest cutbacks were in telephone and water utility financings—down by 85 and 72 percent, respectively.

**INVESTOR-OWNED UTILITY SECURITY OFFERINGS**
**($000 — 1987 vs 1986)**

| | JANUARY 1, TO DECEMBER 31, 1987 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | TOTAL | % CHANGE | ELECTRIC | % CHANGE | GAS | % CHANGE | TELEPHONE | % CHANGE | WATER | % CHANGE |
| TOTAL FINANCING | 21,074,946 | (43) | 15,910,132 | (33) | 3,758,274 | (8) | 1,390,000 | (85) | 16,540 | (72) |
| LONG-TERM DEBT | 18,352,487 | (47) | 13,706,382 | (36) | 3,244,405 | (16) | 1,390,000 | (85) | 11,700 | (22) |
| PREFERRED STOCK | 2,364,125 | 40 | 1,958,000 | 17 | 406,125 | ∞ | 0 | — | 0 | (100) |
| COMMON STOCK | 358,334 | (68) | 245,750 | (62) | 107,744 | (52) | 0 | (100) | 4,840 | (89) |
| BY TYPE OF SALE | | | | | | | | | | |
| PUBLIC | 19,060,746 | (47) | 15,335,132 | (34) | 2,425,774 | (36) | 1,295,000 | (86) | 4,840 | (89) |
| PRIVATE | 2,014,200 | 60 | 575,000 | (7) | 1,132,500 | 257 | 95,000 | (69) | 11,700 | (22) |
| BY PURPOSE OF SALE | | | | | | | | | | |
| NEW MONEY | 14,156,632 | (14) | 9,918,477 | (17) | 3,196,615 | 7 | 1,025,000 | (28) | 16,540 | (72) |
| REFUNDING | 6,918,314 | (67) | 5,991,655 | (49) | 561,659 | (49) | 365,000 | (95) | 0 | — |
| BY METHOD OF SALE | | | | | | | | | | |
| COMPETITIVE | 4,765,125 | (51) | 4,285,125 | (30) | 0 | (100) | 480,000 | (84) | 0 | — |
| NEGOTIATED | 14,295,621 | (45) | 11,050,007 | (35) | 2,425,774 | (22) | 815,000 | (87) | 4,840 | (89) |
| PRIVATE SALES | 2,014,200 | 60 | 575,000 | (7) | 1,332,500 | 320 | 95,000 | (69) | 11,700 | (22) |

# COMMENTARY

## IPPs offer capacity at minimal risk to utilities

**The electric utility industry is, for once, in a position where it can test the efficacy of a major change in the way it does business without assuming major risk. Over the next three to five years or so, utilities will have the oppportunity of testing whether they can provide adequate, economic and reliable power supplies without major investment in new generating facilities and the huge risks we have come to realize go with them...in effect have its cake and eat it too.**

**Emergence of Independent Power Producers formed with the sole objective of building and operating power plants with the outputs going to one or more electric utilities provide the foundation for this test, under PURPA.**

**No longer will service to utilities under PURPA be secondary or tertiary contractual arrangements by managements more interested in process heat, production-line output, or chemical thru-put, as with many cogenerators.**

**Managements of IPPs (and these may include subsidiaries of utility holding companies) can only succeed if they serve the electric utility well. The utility, or utilities, are and will be the sole customer(s) of the IPP.If the IPP managements can't compete in terms of cost and reliable service they will be out of business, plain and simple. For this reason, managements of IPPs are approaching the market with full awareness of the requirements, including the need for consistent, quality maintenance.**

**The opportunity to test the merits of using IPPs comes from the continuing surplus of generating capacity and the relatively low level of demand for new facilities over the next few years. While there may be need for new capacity, which IPPs can fill in a timely manner, the level will be such that only a small portion of total electric industry capacity will be involved. Should the experiment prove uneconomic or if the supply should be of unacceptable reliability, back-up replacement power will be available. Thus, utilities can conserve capital, move ahead with growth and system extension plans, and yet maintain reliable, economic service to customers without major capital investment. As Roger Sant, Chairman and President of Applied Energy Services, a large IPP, suggested recently, there will be no better time to test the approach. For utilities, it will be win-win situation.**

**Most utilities can be expected to adopt a wait-and-see attitude, exercising their normal conservatism. But an adventuresome few will get together with IPP managements to see if there aren't mutual benefits accruing to all from increased mutual cooperation.**

**Admittedly, it's a new tack for utilites to take, but the risks are far less for utility management than committing to build major new power supply facilities under today's regulatory uncertainties. And they are far fewer than in dealing with cogenerators of questionable capabilities and committment.**

*Robert A. Lincicome, Editor-in-Chief*

## Four nominated for Edison Medal

WASHINGTON—Four utilities have been nomonated for the Edison Award, the highest recognition given out by the Edison Electric Institute:

**Baltimore Gas & Electric Co.**, for demonstrating corporate leadership through development of a broad range of educational and community service programs.

**Consumers Power Co.**, for aggressive operational reorganization to recover from the near-fatal impact of its Midland Nuclear Plant, including formation of partnerships to convert and own the Midland combined-cycle plant and the Palisades Nuclear Plant, settling a variety of legal issues.

**Pennsylvania Power & Light Co.**, for developmemt of a focused marketing program aimed at increasing area employment and kWh sales without increasing demand.

**Virginia Power Co.**, for creative corporate redirection to make non-utility power and diversification vital parts of its competitive makeup.

### Correction notice

Last month in a lead New Product item, FlightSafety was erroeneously identified as a part of Singer Corp. FlightSafety is not related to Singer in any way, we have been informed.

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# LETTERS

### Changes ahead for electric industry

More letters on page 16

I am a bargaining unit employee of an electric utility in New Jersey,and I read my supervisor's copy of *Electric Light & Power*. I enjoy its thoroughness and fair reporting.

I am writing about your editorial in the December issue (p.4). I am in my 40s, and like your daughters I was fond of Bob Dylan and was supportive of the issues he sang about in songs like "The times, they are a-changing." Ironically, I am not sure that I like all the changes that seem to be coming for the electric utility industry.

You didn't mention the word "deregulation" specifically in your editorial, but it seems to be the main impetus behind most of the changes you describe. The bottom line to me seems to be that as an industry we no longer have as our priority providing reliable, reasonably priced electricity to our customers.

Now we are worried about competition, we're thinking about diversification and restructuring, and we're starting to behave like typical capitalist corporations. Now our most important customers are those large users who could perhaps buy their power from the cogenerators across the state or the power plant with the extra capacity out west.

We're starting to lay off employees and bargain harder with our unions to squeeze more efficiency out of the workers. But what will happen to the quality of service to individual customers like you or me? And if prices are lowered to keep the big customers, who will make up the difference? In the last sentence of your editorial you state "...the opportunities never have been brighter, either." Brighter for whom and in what way,?

Who benefits from changing the electric utility industry? Certainly not the senior citizens who have their money invested in what they believe to be secure, conservative utility stocks. You point out that diversification is risky. What makes utility executives think [that] because they have been successful in a non-competitive regulated businessthey can go out and be successful in fields and environments in which they have no experience? Why would they want to in the first place? Presumably if an individual executive wants the challenge of a competitive environment, he would not choose to work at a utility.

Certainly the changes will not benefit those employees who are being laid off or asked to do more work. If work crews are being reduced by layoffs or attrition, this doesn't bode well for the customers who depend on them for reliable electric power. Undoubtedly there are some people or companies who will make out very well if these changes come, but I think it is unlikely that they will be the people who are now executives or employees in electric utilities or the small customers of electric utilities.

I am writing this letter because I am upset with you as a trade publication and with the executives in the industry for not answering the question," Why change?" The feeling I get from what I read and from what I hear from executives in my company is that what is coming is coming, and we're powerless to do anything about it, so we're going to do what we can to get ready for it. That's fine up to a point, but how about answering the hard questions, and if the answer is that these changes are bad, then fight back. Speak out. Lobby. I get the feeling we're just passively laying here for this steamroller called deregulation to roll over us. What's even more disturbing is that when you ask questions, they don't even seem to know who is driving the steamroller!

I suppose the final verdict on deregulation of the phone company isn't in yet, but as an individual consumer and part of a corporate one, I can't see that the product has gotten any cheaper, and I know the quality of service is worse. If the change is marginally better or worse, I can't see any justification for the change. What is wrong with a company, such as the one I work for, that provides reliable electricity to its customers at reasonable rates, is sensitive to their needs, is involved in community affairs in many ways, and provides a good secure place of employment for thousands of people? Why should this change? So some entrepreneurs can have a chance to get rich quick? So some gigantic energy user can save a few bucks on their power costs? So some politician can look good for busting the power company?

I hope that your publication will address these questions and come up with some good anawers before it's too late. I think our industry, perhaps more than others, has an obligation to consider the results of possible changes in light of what's the best for our communities and our country.

*John D. Bartram*
*Westfield, NJ*

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Editor's note: We share many of reader Bartram's concerns. However, the objective of the December editorial was more to cite the developments that will be affecting the electric utility industry in 1988 and beyond than to discuss their pros and cons.

We don't see deregulation as the trend, so much as reregulation, which may force substantial changes in the ways utilities conduct their business. There has been, and is, substantial opposition at every level to many of the changes discussed. But ultimately the question is not so much whether changes are coming, but when and how utilities can best accommodate to those changes.

Certainly not all utilities will be affected in the same way, nor to the same degree. The challenge for utility managements will be to determine where opportunities are presented that can favorably affect the utility's service to both customers and shareholders.

Society is changing in many ways. And as society changes, demands on the institutions that serve society will change. Institutions, and that includes electric utilities, must change to meet those new requirements, or must convince the groups of society they serve to let them continue in their old ways. The latter is highly improbable. If history teaches us anything, it is that when the desires and expectations of society change, institutions must bend to those changes or be swept away.

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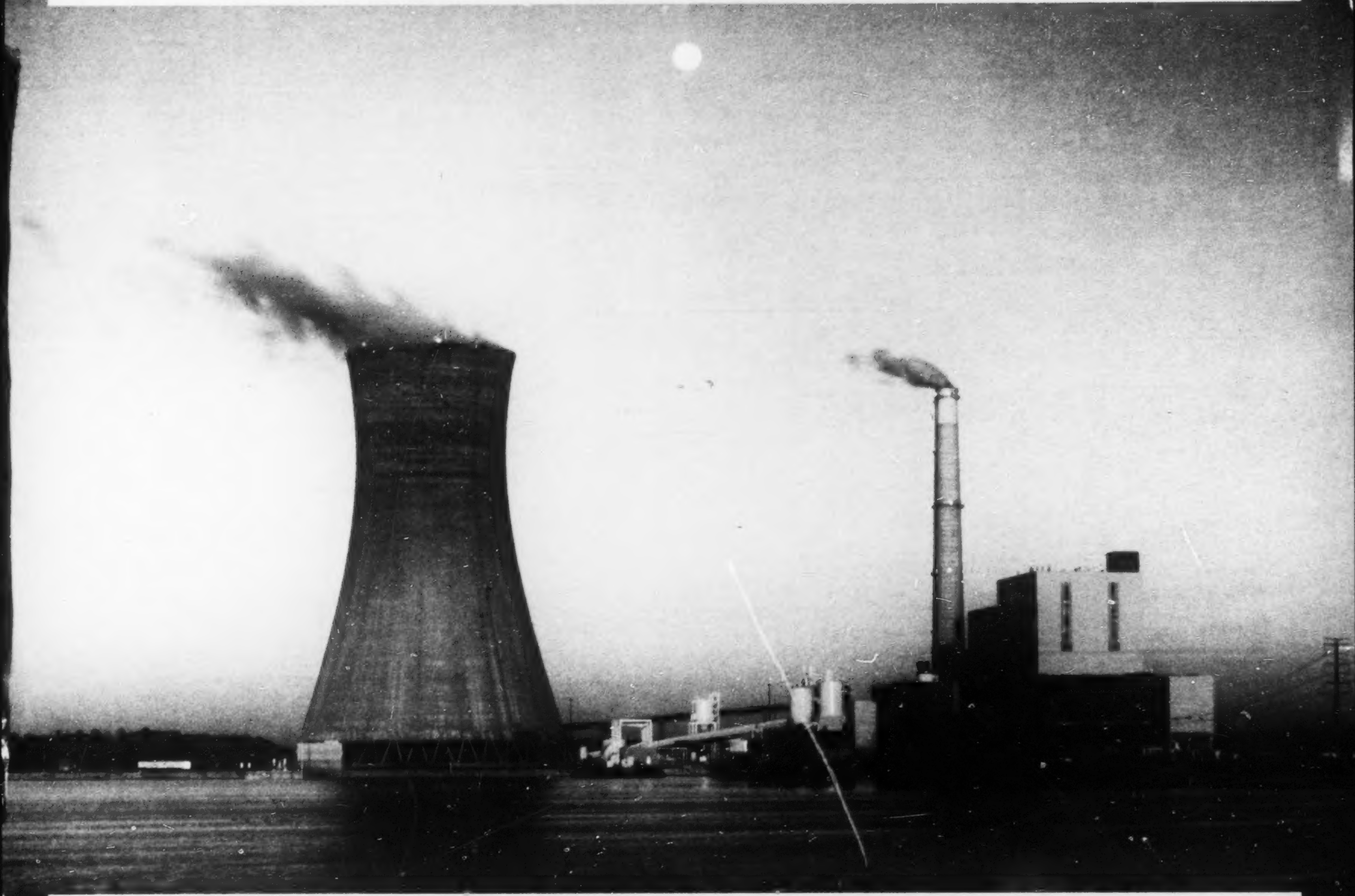
### Simplifying LTC selection

I noted in your January 1988 edition of *EL&P* a letter from Mr. C.N. Pany of H.K. Porter, commenting on your article titled "Evalation method can ease LTC Selection ," from October *EL&P*, p. 30. Even though I agree with Mr. Pany that the article treated the evaluation of on-load tap changere in a rather simplistic manner, I still feel that it made a very useful contribution by highlighting the fact that all on-load tap changers are not equal and that the cost of operation, over the life of the transformer, should be a part of the evaluation process.

Today, virtually every electric utility evaluates the worth of excitation and load losses, but, in my experience, very

Continued on page 26

# Stanton Energy Center

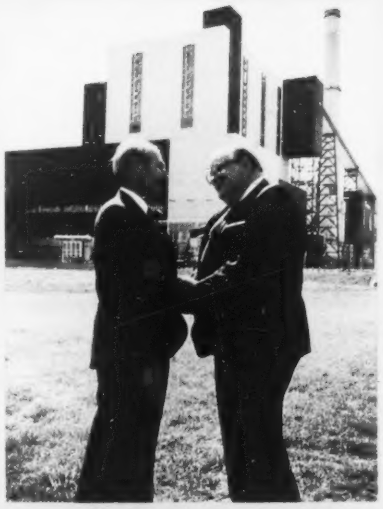


# Florida Project On Budget, Ahead of Schedule

The Orlando-based Stanton Energy Center is the first all municipal, joint ownership power plant in Florida, serving more than 500,000 people from Jacksonville Beach to Key West.

The Orlando Utilities Commission (OUC) owns 68.6 percent of Stanton Unit 1 and operates and maintains the plant. The Florida Municipal Power Agency, with a 26.6 percent interest, represents 11 municipal members. The Kissimmee Utility Authority owns a 4.8 percent interest.

The 415 megawatt coal-fueled unit was complete three months ahead of schedule and on budget.



Worker injury rates were less than half the national average. There was no lost time due to labor-management problems. The unit was designed to utilize the latest power plant technology.

Black & Veatch was responsible for engineering design, construction management, and the worker safety program. Shown on site are Earl Windisch (l.), Black & Veatch partner, and Curt Stanton, OUC general manager from 1948 to 1983.

Black & Veatch, Power Division
P.O. Box 8405, Kansas City, Missouri
(913) 339-2000

**Black & Veatch**
**Engineers-Architects**

Inquire R.S. 7

# Plant construction is spiralling down, says UDI report

WASHINGTON—A survey of utility-owned, power-plant construction plans showed that U.S. utilities placed over 10,000 MW of new generating capacity into service in 1987. That was the good news.

The bad news was that this was far below the 16,000 MW put in service in 1986 and even under the 13,000 planned for 1988. But all three amounts soar above the projected amounts for 1989 and 1990, which are 8000 and 2200 MW, respectively.

### What's going on

These numbers appear in the report from Utility Data Institute that is called "Projected Capital Costs: U.S. Electric [illegible]nts". As UDI's President Liz Hannon notes in the report, "The new central-station pipeline continues to empty at a rapid pace." Eight previously-planned, steam-electric units were removed from UDI's database last year.

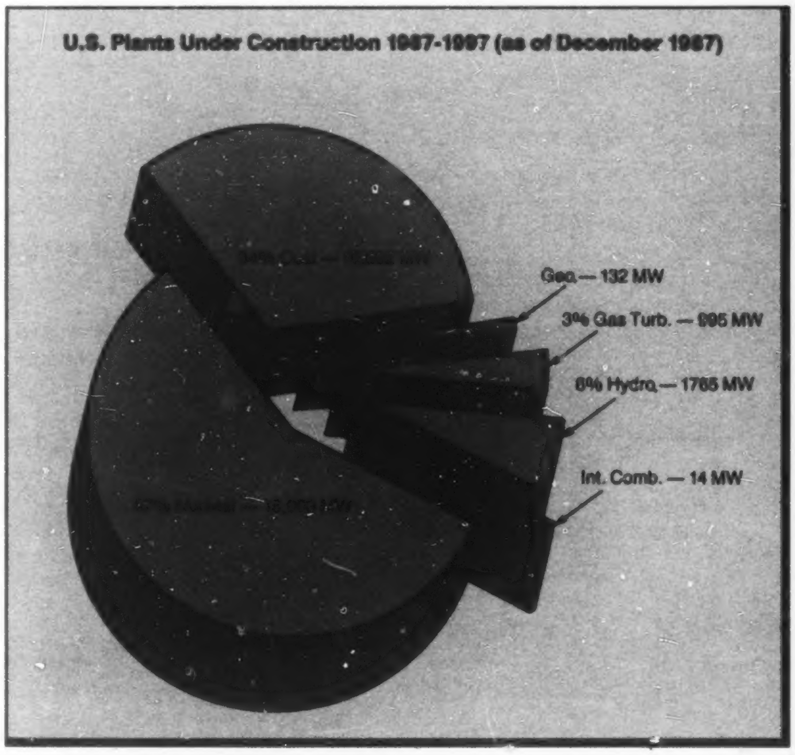
Again it is a bad news/good news situation, however. In this case, the good news is that escalations in estimates of new plants' capital costs have slowed. Noted Christopher Bergen, UDI's vice president, "...these new thermal and hydro units...are now coming in under budget, and on or ahead of schedule."

A little more good news is that new construction started on a utility coal plant for the first time in approximately five years. Site work began in November 1987 on a 150-MW, fluidized-bed, lignite-fired unit near Calvert, TX. It is to be turned over to the Texas-New Mexico Power Co. when completed.

### Other action

On another related front, nearly 30 new gas-turbine peaking units were added to the total utility capacity in 1987.

The report also gives summary statistics on utility capital expenditures for fuel conversions, repowering, and life-extension activities. It indicates ongoing strategies to ensure cost-effective operation of existing plants in the face of steadily-eroding reserve margins.



# Fossil plant performance better after 1974

PALO ALTO, CA—Availability of fossil-fueled power plants improved in the decade ending with 1984, after a substantial decline in the period from 1965-1974. However, according to an Electric Power Research Institute study, the 1984 performance level still trailed that of 1965 by about 6 percent.

While the performance of all fuel types fell through the mid-1970s, coal unit performance deteriorated more than either oil or gas units. But by the end of 1984, there was virtually no difference among the performances of coal-, oil- and gas-fired units.

EPRI reported that plant and component availability can have a huge impact on both individual utilities and the entire industry. A 1-percent improvement in availability for just a 100-MW coal-fired plant could result in a $1.5-million cost saving, depending on the utility's load profile and unit mix.

The study showed that vintage was an important factor. Within size ranges, more recently completed units generally performed better than older units.

Considering both size and vintage effects, the overall performance differential between sub- and supercritical coal units ranges from 1 to 2 percent. Recent availability of balanced draft units improved on that of pressurized (and never converted) sub- and super-critical units by 1.5 percent.

For oil and gas plants, the differential ranged between 5 and 10 percent.

Conversion to balanced draft operation appeared to improve the availability of both sub- and super-critical coal-fired units. After allowing for vintage and calendar-year effects, this improvement was reported to be 3-5 percent. However, since units prior to conversion were performing 6-10 percent below unconverted pressurized units, the improvement did not hit the level of either the unconverted or balanced-draft units.

Outage data from 1965 through 1984 were studied for 668 fossil-fueled units rated 200-MW and larger. These generating units covered approximately 7700 unit-years of experience. Analysis included overall unit performance, as well as the contribution of major equipment, such as boiler and turbine, to performance levels. Investigators consolidated the normal event code used by EEI into 53 cause code groups.

# Water chemistry analysis course to be offered

COLUMBIA, MD—Improved performance and reliability of technicians and engineers engaged in water chemistry is the goal of a special course to be offered by General Physics Corp.

### Course covers

The course GP is offering for the mid- to latter-part of the year is titled "Spectrophotometric Methods of Analysis in the Ultraviolet/Visible Range." Designed for technicians and supervisors, the 2½-day course will cover analytical methods, instrument components and performance characteristics.

For more information contact Lorin at General Physics Corp., 10650 Hickory Ridge Road, Columbia, MD 21044, or by calling (800) 638-3838.

# Creepy crawler goes where other vehicles can't reach

LONDON—A low-profile inspection device developed by engineers at the Central Electricity Generating Board, the UK's national utility, has a novel articulated center section that enables it to climb into places other vehicles can't reach.

The SPIV (Steam Pipework Inspection Vehicle) is being used to check welds inside pipes and so eliminate the need to remove exterior lagging.

### Crawl and squeeze

Armed with a minature camera, SPIV can crawl into pipework through 125-mm valves. It can squeeze through measuring nozzles just 100 mm in diameter. It then can film pipe runs, up to 150 meters, from the inside.

CEGB says the prototype device already has paid for itself. It has recovered its £25,000 hardware costs identifying main steampipe welds at the Padiham power station in northern England.

### One-off operation

Geoff Frost, maintenance superintendent at the plant, says "This was a one-off operation as far as we are concerned. The alternative would have been to remove all the external pipe thermal insulation, then try to identify all the welds from the outside, a very difficult operation and a time-consuming one at that."

# Missouri co-op tops record mine output

Associated Electric Cooperative Inc., which provides power to 40 electric cooperatives in Missouri, set a production record at its Thomas Hill, MO, mine last year. Some 2.4 million tons of coal were mined for the co-op's nearby generating station, surpassing the previous record by 20 percent. Associated's surface mines cover approximately 25,000 sq acres, with 400 acres m[illegible]ed annually. The G&T co-op, with 2300 MW of generating capacity, is the nation's largest wholesale supplier of power to RECs. Line truck (lower right) shows scale.

# Idaho Power faces hydro shortage

BOISE, ID—Idaho Power Co.'s hydroelectric prospects have gone from bad to worse this year. Hydro generation, which represents a substantial portion of the utility's total sales and contributes to the company's ability to hold its own retail rates down, is drying up for the second year in a row, the utility says.

### Projections

According to projections by the company's hydrologist, Scott Larrondo, the Spring runoff is expected to be less than half the 25-year average. With 16 hydro facilities in the Snake River basin, representing 60 percent of the company's total generating capacity, the shortage of runoff means the utility will have to depend more heavily on its more-expensive coal-fired generating units or buy power from neighboring utilities.

### Low streamflow

The low streamflow also will mean that IPC will have little low-cost power to sell to other utilities for the second straight year. The company budgets some $68-million in revenues from its surplus energy sales. Without this, the company's rates to its own customers will not be adequate to provide a fair return to shareholders. Last year's revenues from surplus power sales were less than $20 million.

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VOICE OF THE ELECTRIC UTILITY INDUSTRY

## LATE NEWS

**UtiliCorp United** will buy NECO Enterprises, the parent company of Newport Electric Corp., for $21.5 million. The purchase is to be made with 55-percent cash and 45-percent UtiliCorp stock. NEC distributes electricity to 30,000 customers in Rhode Island. UtiliCorp, based in Kansas City, sells electricity and gas in seven states. Regulatory approval is expected by late summer.

**Illinois Power Co**. was 89-percent prudent in activities related to the $4.3-billion, 950-MW, Clinton nuclear power station, says the audit team of Touche-Ross and Nielson Wurster. IP said it "strongly disagrees" with the $455.8-million disallowed recommendation, citing three company-sponsored audits that show "a pattern of responsible, responsive, capable management."

**CMS Energy Corp.** agreed to buy 49 percent of Oxford Energy Co., a resource recovery and power generation firm, for an undisclosed amount under $30 million. See related story, page 20.

# Industry reacts to FERC

### *Comments vary widely concerning proposed rules*

WASHINGTON—By May 12, industry leaders are to formulate the first of three written responses to the Federal Energy Regulatory Commission's proposed rulemakings intended to increase competition, as PURPA originally intended.

The first comments will cover administrative avoided cost. Written comments on proposals for bidding and IPPs are due June 13, and reply comments a month after that, as reported in April's *EL&P*.

In addition to the three rulemakings, Commissioner Charles C. Stalon submitted a wheeling proposal for comment. FERC has said transmission action will follow by year's end.

**Proposed rules outlined**

The proposed rulemaking on administrative avoided cost, under Public Utility Regulatory Policies Act RM88-6, is to provide extra guidance to states that choose to set the costs utilities must pay to qualifying cogeneration and small-power production facilities.

The proposed rulemaking on competitive bidding programs would establish rates for power purchasers from qualifying facilities (QFs) under PURPA RM88-5. It would give states the option of using bidding and sets guidelines for state regulatory authorities and nonregulated electric utilities to accurately set avoided costs of utilities in purchasing power from QFs. Briefly:

√ Bidding would be voluntary.

√ At the state's discretion, bidding could extend to all sources, including bids by the native utility.

√ Nonprice criteria, such as reliability and dispatchability, would be factored into bidding evaluation.

The proposed rule on IPPs, addressing PURPA RM88-4, proposes streamlining regulations for independent power producers. IPPs sell power to customers in areas where they have no service franchise and lack significant market power. Under the proposal, IPP:

√ Rates determined through competitive bidding or rate negotiation would be accepted under the Federal Power Act. Rates would be subjected to a price cap based on the purchaser's current or projected avoided cost.

√ Facilities would be exempted from cost-related accounting, reporting and record-keeping requirements.

√ Corporate regulation procedures and

Continued on page 7

# Westinghouse and ABB to merge T&D, generation

PITTSBURGH—Westinghouse Electric Corp. and ABB Asea Brown Boveri Ltd. signed a memorandum of understanding to establish two joint ventures to serve the power generation, transmission, and distribution fields in North America and selected international areas, in a surprise announcement on April 12. The agreement was announced jointly by John C. Marous, chairman and chief executive of Westinghouse, and Percy Barnevik, president and chief executive of ABB.

The formation of the partnerships is subject to definitive agreements, approval by the respective boards of directors, and government approvals. Finalization is expected late in '88.

**Two partnerships**

The memorandum proposes two different partnerships between the corporations. The first partnership will be for the manufacture, sale, service, and maintenance of steam turbines and generators for regulated utilities in the United States and Canada. The second will involve equipment for transmission and distribution.

Westinghouse will have 55 percent of each partnership and ABB will have 45

Continued on page 17

# Canadian power exports to U.S. jumped 34% in '87, 2% of U.S. use

MONTREAL—Exports of electricity to the United States from Canada increased by 12.1-billion kWh in 1987, to 47.4-billion kWh. This represents a gain of just over 34 percent for the year, according to an analysis of Canadian National Energy Board statistics by the Canadian Electric Association.

While Canadian exports of electricity soared in 1987, they nevertheless represented only eight pecent of Canadian output and two percent of U.S. consumption.

During the same time, U.S. export revenues to Canadian utilities increased by 12 percent, to $1.2-billion (Canadian).

**BC recorded biggest gain**

Although much publicity has focused on the negotiations and agreements of eastern Canadian utilities and their counterparts in the Northeastern part of the U.S., the largest 1987 increase in exports was recorded, somewhat surprisingly, by British Columbia on the West Coast. BC's export of electricity increased about 600 percent to 13-billion kWh. Revenues surged 380 percent, to $200-million (Canadian).

While the increases were especially large in 1987, the province has been subject to substantial swings in recent years because of transmission access problems in the Pacific Northwest, where U.S. utilities received first rights to available trans-

Continued on page 8

## *New Nuclear Units*

**Twenty-one nuclear units were started up, worldwide, in 1987, bringing the total to 416 reactors with capacity of 294,864 MW in 26 countries, according to the International Atomic Energy Agency in Vienna. New in 1987:**

U.S. ⚛⚛⚛⚛⚛⚛⚛⚛
France ⚛⚛⚛⚛
U.S.S.R. ⚛⚛⚛⚛
Bulgaria ⚛
Canada ⚛
Czechoslovakia ⚛
Hungary ⚛
Japan ⚛

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# NRC votes to restart Sequoyah 2

The Nuclear Regulatory Commission voted to allow two closed nuclear plants to be restarted—the Tennessee Valley Authority's Sequoya 2 (shown above) and the Sacramento Municipal Utility District Rancho Seco. Both had been closed since 1985; Sequoya 2 since August and Rancho Seco since December. The Sequoya plant, near Chattanooga, TN, is the first of TVA's five shut nuclear plants to be restarted. TVA expected the facility to resume commercial operation in a few days and to be up to full power in weeks. In its March 15 report, the Advisory Committee on Nuclear Reactor Safeguards noted that TVA had addressed the problems and deficiencies that had been found at the plant.

# NEWS BRIEFS

**JILL MINNER**, Assistant Editor

## UtiliCorp to purchase Newport Electric Corp.

UtiliCorp United has reached an agreement with NECO Enterprises, Inc. to purchase NECO, the parent company of Newport Electric Corp., for approximately $21.5 million in stock and cash. Under the agreement, UtiliCorp will buy all of the outstanding stock of NECO Enterprises for $22 per share. "Newport Electric is a winter-peaking utility that balances our predominantly summer-peaking electric operations, in addition to spreading our regulatory and climate risk," stated UtiliCorp President and CEO Richard C. Green, Jr. "We intend to operate Newport Electric as a division under its existing name and without any change in management or employees."

## Bonneville Pacific buys PTS majority interest

Bonneville Pacific Corp. has acquired a controlling interest in Pacific Turbine Systems, Inc. According to Bonneville Pacific Chairman Raymond L. Hixson, the company wants to play a significant role in the emerging energy storage business while expanding its new business opportunities throughout the country. "PTS has developed an innovative, cost effective and environmentally benign technology that can be immediately applied to solve the [energy] shortfall problem. It will generate enough power to allow existing power companies to meet maximum energy demand without adding new generating capacity," Hixson added.

## General Cable division acquires Holan line

General Cable Company's Apparatus Division recently acquired the Holan product line from Dorsey Trailers, Inc. Holan manufactures heavy-duty material handling aerial lifts for the power utility industry, line vehicles and aerial lifts for telecommunications systems and streetlight maintenance. Apparatus Division President Van Walbridge explained that the acquisition is an implementation of the division's long-range strategic plan to provide a full line of high quality products and services to the telecommunication and power utility industries.

## GPU to make Energy Initiatives a subsidiary

General Public Utilities Corp. (GPU) said it plans to make Energy Initiatives, Inc. (EII) one of its subsidiaries. Energy Initiatives develops cogeneration and small-power-production projects, and has been operating as a subsidiary of Jersey Central Power & Light Co. (one of GPU's operating utility subsidiaries). According to GPU Chief Financial Officer John G. Graham, "...moving EII from JCP&L to GPU will allow EII to aggressively pursue cogeneration and independent power opportunities throughout the U.S." "EII also will provide us with the ability to take minority equity positions in independent power projects, whether they are developed by EII or others," Graham added.

## Low revenues force Idaho Power to request surcharge, cut budget

Idaho Power Company has asked the Idaho Public Utilities Commission for a $41.3-million temporary surcharge on electric rates in order to deal with its worsening revenue situation. The revenue shortfalls, caused in part by a two-year drought, have already forced the utility to reduce its workforce; institute a hiring freeze; defer material-intensive construction projects; eliminate all but essential employee travel; and eliminate company-sponsored employee activities.

## NRC asks utilities to inspect electrical relays

Utilities operating or building nuclear power plants have been requested by the Nuclear Regulatory Commission to inspect certain electrical relays made by General Electric Company. General Electric told the NRC that some of its latch-type electrical relays were not operating properly and that premature unlatching could occur. The commission said it has asked licensees to check for adequate latch engagement in specified models used in safety-related equipment. The inspection should be made for all specified relays manufactured before November 1, 1987.

## Florida Power, Wolf Creek fined by NRC

The Nuclear Regulatory Commission said it has proposed $100,000 fines against both Florida Power Corp. and Wolf Creek Nuclear Operating Corporation. Florida Power received a civil penalty for alleged noncompliance with NRC requirements at the Crystal River nuclear power plant. Wolf Creek was fined for violations of NRC regulations that took place during a refueling shutdown at the company's Wolf Creek generating station.

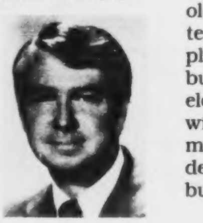
## Hanford to evaluate metal fuels for FFTF

Westinghouse Hanford Company announced that it will evaluate metal fuel, instead of ceramic oxide, as a core for the Fast Flux Test Facility. "The purpose is to evaluate the metal fuel and verify its potential advantages in lower fuel-cycle costs, increased inherent safety, and increased proliferation resistance," explained Michael K. Korenko, manager of the company's advanced reactor development division. After a metal fuel process line is established and the metal fuels have been tested, several prototype metal fuel assemblies will be built, Korenko said. Hanford expects the equipment to be fully operational in 1989.

## NorLight doubles capacity to Chicago

According to Norlight, it has doubled its fiber optic communications network transmission capacity between Milwaukee and Chicago and between Chicago and Janesville, WI. The added capacity, which went into service April 1, was needed to handle an increased volume of voice and data transmissions over the fiber optic lines, said NorLight President Gary Henshue. NorLight is a partnership of subsidiaries of five utilities, which operates the fiber optic communications network linking Chicago, Milwaukee and Minneapolis.

## Guzzle to head TECO


Timothy L. Guzzle

Timothy L. Guzzle was appointed president and chief operating officer of TECO Energy, Inc. succeeding H.L. Culbreath who will continue as chairman and CEO. Guzzle previously worked for Allegheny International, Inc. as president of industrial and technology businesses, corporate executive vice president and corporate director. "Following many conversations with Tim and members of our Board, it became clear to us that his strength in the leadership of complex, diversified corporations was the quality we needed most for the future of TECO Energy. His excellent track record was very attractive to all of us," noted Culbreath. TECO Energy is a diversified, energy-related holding company. Its principal operating companies include Tampa Electric, TECO Diversified and TECO Investments.

## GPU president to retire

General Public Utilities Corp. President and Chief Operating Officer Herman M. Dieckamp annouced that he plans to retire on June 30. Dieckamp, who will turn 60 in June, served at his current position for most of his 15 years with the company. "Herman Dieckamp had an important and positive impact on the GPU system throughout his time with us. He will be missed," said GPU Chairman and CEO William G. Kuhns.

## WNFM appoints Wolf chairman; Clements named vice chairman

Walt H. Wolf was named chairman of the World Nuclear Fuel Market's Board of Governors and Andrew A. Clements was chosen as vice chairman.

## Wisconsin Energy says earnings grew, energy prices were down in '87

Wisconsin Energy Corp. reported a year of solid growth in earnings and low energy prices in 1987. Wisconsin Energy Chairman and CEO Charles S. McNeer said that the company has employed aggressive marketing of conservation programs to help meet the demand for power, while keeping electric rates low by delaying the need for new power plants. The company's long-term planning stresses conservative financial management and aggressive operations management. "The plan combines a comprehensive energy conservation program for customers, the purchase of an existing power plant, the installation of small combustion turbines and the renovation of several older generating units to extend their operating lives," explained McNeer. "Our principal business will continue to be electric and gas operations with careful and deliberate moves into diversified areas designed to pave the way for business growth," he added.

## Hearings conducted on hydropower contracts

A portion of the New York Power Authority's (NYPA) new statewide hydroelectric power allocation program was the subject of a public hearing held recently in Albany, NY. The hearing concerned three proposed contracts that would provide Niagara Mohawk Power Corp., New York State Electric & Gas Corp. and Rochester Gas & Electric Corp. with low-cost hydropower from NYPA's Niagara and St. Lawrence-Franklin D. Roosevelt Projects. The utilities would then provide the power, without profit, to residential and farm consumers. NYPA Chairman Richard M. Flynn said that Power Authority trustees would not approve the proposed contracts until satisfactory arrangements are completed for transmission of NYPA electricity by the three utilities to municipal electric systems, rural cooperatives and industrial customers. At press time, negotiations between NYPA and the utilities were still underway. The new contracts would extend through 2007 and would replace agreements that expire Jan. 1, 1990.

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# NU, NEES show interest in PSNH operating assets

MANCHESTER, NH—Northeast Utilities and New England Electric System have expressed interest in buying the operating assets of Public Service of New Hampshire, a neighboring utility that has been under Chapter 11 protection since Jan. 28.

Both NU and NEES officials said, however, they would rather not increase their shares of the troubled Seabrook nuclear plant. NU owns 4.1 percent of Seabrook through Connecticut Light & Power; NEES, 10 percent, through New England Power Co.; and PSNH, 35.6 percent.

### Timing uncertain

Timing for any action is uncertain because approval of shareholders, the court, and state and federal regulators would be necessary. Price was not discussed, although the operating assets have a book value near $800 million.

William B. Ellis, NU's chairman and CEO, said, "We continue to believe that Seabrook is needed for New England, and that it should be allowed to operate, but we are not planning to increase our investment in the plant."

Robert J. Harrison, president and chief executive officer of PSNH, said, "PSNH is, as it always have been, committed to fully exploring all options available to determine the best course of action for its customers, creditors and employees."

NU's Ellis said, "Our preliminary analysis suggests that there is more value for customers in an NU-PSNH combination than any others," perhaps referring to NU's surplus capacity in an energy-deficit region.

NU, the large New England utility system, has 1.025-million customers in Connecticut and 185,000 in western Massachusetts.

NEES has a slightly better debt rating than NU and has 32,000 customers in New Hampshire through its Granite State Electric Co. NEES' customers in Massachuesetts and Rhode Island, total 1.204 million.

Moody's Investor Service said a sale to either NU or NEES would likely involve some form of rate stabilization for New Hampshire customers, making the transaction attractive to many. Moody's confirmed the debt and preferred stock ratings of Connecticut Light & Power Co. and Western Massachusetts Electric Co., the principal operating subsidiaries of NU.

NEES System Senior Vice President-Finance Alfred Houston said if the sale went through, "Another New Hampshire subsidiary of NEES would be formed. The [PSNH] employees would work either for the new company or be given the opportunity to be transferred to one of our other System companies."

### PSNH files appeal

In related news, PSNH appealed to the U.S. Supreme Court to overturn the NH Supreme Court's decision upholding the constitutionality of the state's anti-Construction Work In Progress (CWIP) law.

As part of PSNH's response to its financial crisis related to Seabrook debt, the utility sought an emergency rate increase to avoid filing for bankruptcy protection.

PSNH argued that the state's anti-CWIP law is unconstitutional because it deprives PSNH of financial integrity without meaningful balancing as mandated in *Federal Power Commission* vs. *Hope Natural Gas Co.* and without a hearing by the state PUC to establish just and reasonable rates. PSNH, as 35.6-percent owner, has more than $2 billion invested in the plant.

### NRC gets Seabrook report

By late April, the Seabrook owners, as a last requirement for low-power licensing, were to submit to the Nuclear Regulatory Commission a technical addition to its emergency plan, explaining how Massachusetts residents will be notified in a crisis.

Those Massachusetts communities within the emergency-planning radius of the New Hampshire plant won the right to remove their sirens as a result of a court case to block the plant's opening. Robert Williams, a spokesman for plant operator, New Hampshire Yankee, said helicopter and truck-mounted sirens will notify (those) residents.

Williams said several technical requirements and opponents' protests to the NRC about PSNH financial health stand in the way of full-power licensing. Other major owners, Williams added, have stated their committment to seeing the project through.

# UI sells transmission for $1.4 million

WESTBORO, MA—A New England Electric System subsidiary has agreed to buy United Illuminating's 5.49-percent share of the Hydro-Quebec Phase 2 transmission project for $1.4 million, pending regulatory approval expected in July. Hearings, which began in March, will resume later this month.

UI officials said extended delays in the permit process and in completing reliability studies have caused project participants to provide more funding than originally anticipated and prompted the sale. The price consists of the amount UI paid into the project, plus interest. UI continued to support the project, saying it would benefit the region, particularly for companies short on capacity.

NEES already owns 18 percent of the project coordinated by the New England Power Pool. New England Power Co. is planning the purchase, while other NEES subsidiaries are financing, engineering and constructing the 1310-MW project. Construction began in February in Massachusetts and April in New Hampshire. The project expands the final transmission link to 2000 MW.

A NEES spokeswoman called the project vital for NEES, saying the additional capacity is welcome. The soon-to-be-completed reliability studies are required before issuance of a Department of Energy presidential permit. Operation, expected by 1990, requires the DOE permit.

When completed, the five converter-terminal system will extend 930 miles from Quebec to Sandy Pond substation in Massachusetts.

The pending sale does not affect UI's 5.75-percent share of the H-Q Phase 1 project, which now provides 35 MW.

Other main owners in Phase 2 include Connecticut Light & Power, with 18.8 percent; Boston Edison, with 11 percent; Public Service of New Hampshire, with 10 percent; Vermont Electric Cooperative, with 9 percent; Central Maine Power, with 7 percent; and Northeast Utilities' Western Massachusetts Electric, with 3.8 percent. Various municipals own other portions.

# Appropriations decrease in '87

**Capital Appropriations and Expenditures of Investor-Owned Gas and Electric Utilities, 1986-1987***

(Millions of dollars, seasonally adjusted quarterly totals)

| | '86 3rd Q | '86 4th Q | '87 1st Q | '87 2nd Q | '87 3rd Q |
|---|---|---|---|---|---|
| **Total Utilities** | | | | | |
| Appropriations | 5,530 | 5,491 | 6,482 | 5,569 | 5,188 |
| Cancellations | 101 | 416 | -329 | 131 | 65 |
| Capital Expenditures | 7,535 | 6,080 | 7,649 | 7,032 | 7,746 |
| Appropriations backlog at end of quarter | 46,699 | 45,694 | 44,856 | 43,262 | 40,589 |
| **Electric Utilities** | | | | | |
| Appropriations | 4,261 | 3,882 | 5,036 | 4,275 | 3,904 |
| Cancellations | 133 | 231 | -444 | -1 | 0 |
| Capital Expenditures | 6,279 | 4,799 | 6,353 | 5,709 | 6,360 |
| Appropriations backlog at end of quarter | 44,092 | 42,944 | 42,071 | 40,638 | 38,182 |
| **Gas Utilities** | | | | | |
| Appropriations | 1,269 | 1,609 | 1,446 | 1,294 | 1,234 |
| Cancellations | -32 | 185 | 115 | 132 | 65 |
| Capital Expenditures | 1,256 | 1,281 | 1,296 | 1,323 | 1,386 |
| Appropriations backlog at end of quarter | 2,607 | 2,750 | 2,785 | 2,624 | 2,407 |

*Estimated totals for all investor-owned gas and electric utilities, based on a sample survey.

Source: Utility Investment Statistics,
Utility Appropriations (Fourth Quarter 1985),
Edison Electric Institute,
American Gas Association, and
The Conference Board.

WASHINGTON—"The investor-owned utilities appear headed for contraction," notes Kenneth Goldstein, The Conference Board economist. "Excess capacity, sluggish demand and regulatory and competitive pressures are likely to hold down capital spending throughout 1988."

Goldstein based his comments on the decline in utility appropriations from $6.48 billion to $5.19 billion during the first three quarters of 1987 (see table and p.46).

Appropriations precede equipment orders, construction contracts and actual expenditures.

# Cogeneration added in California, ratepayers to be hit

Three of the four units of the new Sycamore 300-MW cogeneration plant shine out at night. The $165-million plant combines its output with another cogen plant to produce up to 600 MW of electricity for Southern California. The two facilities also will generate 3.6-million pph of steam to help recover as much as 127,000 bbl per day of heavy crude oil from the Kern River oil field adjacent to Sycamore.

SACRAMENTO, CA—The photograph shows a brand-new cogeneration plant in Southern California. But it is not necessarily a positive sign.

J. Steven Herod, FERC director of regulation, noted that pricing under the Public Utilities Regulatory Policy Act has not worked well, particularly in California. He pointed out that Southern California Edison and Pacific Gas & Electric made more than $1 billion and $800 million, respectively, in overpayments to PURPA-qualified facilities because of an oversupply of power and the administrative pricing guidelines.

### Bears out report

This bears out a late-1987 report to the state legislature on joint California Energy Commission/California Public Utilities Commission hearings concerning excess generating capacity in the state. The hearings noted how the California Legislature had predicted that proposals for new generating plants exceeded the reasonably-foreseeable demand for electricity in the state.

Capacity surpluses were predicted to continue through the mid-'90s for most of the areas covered. And the hearings confirmed that ratepayers would bear the burden of paying for this excess.

The estimated amounts of these overpayments varied widely, but all agreed that they would have to be made and that they would be large.

Attempts by *EL&P* to reach anyone at CPUC to comment on the hearings' report or to update it met with no success. Chuck Imbrecht, chairman of CEC, told *EL&P* that his group and CPUC are working to establish new types of bidding contracts to avoid these overpayments in the future.

# COMMENTARY

## It's time for utilities to get their nuclear act in order

**The nuclear industry, if we believe its critics, is as dead as the dinosaur. Even the fact that there are some 109 nuclear units generating power in the U.S. doesn't impress them. If anything, the constant string of woes that have hit the increasing number of nuclear utilities—from insupportable debt to NRC's constant string of fines against utility operators of nuclear plant rule violations to forced closings of nuclear units ruled unsafe—provide critics with more powerful ammunition. Nuclear utilities may have circled the wagons, but can they hope to do more than just hold out?**

**There's little consolation to be found in recent events. Philadelphia Electric's inability to deal with its staffing, training and operating problems at Peach Bottom toppled its chairman and president. Boston Edison's Pilgrim Station remains an operational question mark. Others across the country are bogged down in correcting deficiencies and trying to get nuclear units completed, started or restarted. The fines keep coming, but the problems persist.**

**As might be expected, Congress appears to have sided with many of the critics of the nuclear industry and is calling for radical restructuring of the NRC. Congress does this sort of thing—yelling for a new format or organization, a reshuffle of the deck, so to speak—when it is confronted with a complex set of problems beyond its range of understanding and expertise.**

**The congressional approach is tantamount to hiring new inspectors for an automobile assembly line when the cause of accidents is really a design failure. It doesn't accomplish much, but it always gets attention in the press and looks like something important is being accomplished.**

**In the present situation, however, NRC may be a large part of the present problem, rather than its solution, not so much because of what it hasn't done, but rather because of what it has done...for all the million and one things it has done...sins of commission, not omission.**

**It seems to us that much of what may be wrong with the entire nuclear industry is the result of severe over-regulation. NRC dictates functional and safety performance standards, as well it should. But then it gets specific and tells utilities how to accomplish these functional requirements by the numbers and in infinite detail. NRC has written, or attempted to write, chapter and verse for any possible operational condition. The fact is that when compliance with such numerous and detailed rules is mandatory, it becomes difficult to go beyond the absolute requirement to comply.**

**The British long ago decided that the function of their nuclear regulatory agency was to ensure the safe operation of their nuclear plants. To do this, the U.K. Atomic Energy Authority developed basic functional criteria...requiring but a few dozen pages to formalize, assigning the how-to to the utility.**

**Conversely, the U.S. Atomic Energy Commission and its successor, the NRC, tell what must be done and how to do it....in thousands of pages. And still we have seemingly endless problems with our nuclear plant operations, despite the absolute, infinitely detailed regulation of NRC.**

**There's got to be a better way! We think self-regulation is the only answer.**

**Nobody in his right mind can think the NRC is going to go away. But if the industry wants to get off the defensive, it will have to get its act in order. That means better quality assurance of internal operations at each operating plant. It means a stronger role for the Institute of Nuclear Power Operations. It means higher operating costs. It means getting tough...in fact, not just in posture. It means acting...on employee drug testing, training...not reacting to NRC directives.**

**The nuclear industry will be needed in the future if the U.S. is to meet its demands for electricity and a cleaner environment. But unless there is a major turnaround in the acceptance of nuclear technology on the part of the general public, as well as Congress, no utility executive will bet his company's existence on a nuclear future.**

**If there is to be a future for the nuclear industry, the industry must do a better job of policing its own operations. But if it's done properly, even the NRC won't be able to mess it up again.**

*Robert A. Lincicome, Editor-in-Chief*

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# LETTERS

### Shiftwork scheduling

Your article published in the August, 1987 edition of *Electric Light & Power*, under Generation Update, proved extremely interesting in pointing out deficiencies in the customary scheduling of shift workers.

Your summary paragraph states that I should not be operating on a 1940-era shift schedule. Your last sentence states, "There are a variety of solutions to the problem."

Having worked shift work for 28 years, while raising four children and since then having spent the last 15 years managing 50 operators on five shifts makes me some kind of an expert on the subject.

I try to keep an open mind on the subject and would be extremely pleased if I could improve the working conditions of my employees before my retirement date.

*Thomas J. O'Reilly*
*Production Supervisor of Operations*
*Commonwealth Electric Co.*
*Canal Electric Company*
*Sandwich, MA*

*Ed. note: In reponse to a number of requests, a follow-up to our August '87 article on shiftwork scheduling appears on page 35.*

### NARUC's rate data

The March 1988 edition of *Electric Light & Power*, page 3, carried a table of the Ten Most Expensive Service Territories in the Continental United States. That table indicated that Central Vermont Public Service Corp. ranked seventh among the top ten for residential service, with an average rate of 11.1¢ per kWh for 500 kWh.

Unfortunately, the data (which the article indicated was taken from a NARUC study for the period December 1986 through February 1987) contained a significant error. The actual cost for that period for our company was an average rate of 10.2¢ per kWh. This value would have removed us from being considered as one of the ten highest-cost utilities. In fact, I believe that our ranking would have placed us at 23rd in the NARUC study.

In addition, it is very important to our company that proper recognition be given to the very seasonal structure of all of our retail rates. Our billings for 500 kWh, as of December 1986, was $33.94 while January and February 1987 billings at that level were $59.73, or a difference of 76 percent.

This differential reflects the very seasonal nature of the pricing signal which we give our customers, rather than the effects of a rate increase. This rate structure has been in place since 1974 and has served its intended purpose of encouraging our customers to moderate their use of energy during the traditional winter peak usage season in Vermont.

In the future, we ask that your staff check the data with our company, especially when the results would place us in a less-than-desirable category. Unfortunately, NARUC does not appear to check its data with the individual utilities before it is published.

*Steven J. Allenby*
*Vice President*
*Central Vermont Public Service Corp.*

*Ed. note: Although EL&P attempts to verify the information it publishes, there is no way we can verify all the data used by others in the preparation of official or quasi-official studies. We would recommend that reader Allenby contact NARUC directly to clarify its winter/summer rate program.*

## EL&P mobile trade show tours mid-America during May and June

BARRINGTON—*Electric Light & Power's* traveling trade show, the *EL&P* Electric Utility Caravan, launches its five-week mid-American tour on May 10. This will be the second annual tour for the Caravan, following a successful swing through the East last spring.

The caravan is slated to make 46 stops to cover 53 utilities located from central Pennsylvania to western Kansas, and from the Canadian border to the Gulf of Mexico.

Thirty-two suppliers to the electric utility industry are participating in the 1988 tour.

### Pennsylvania beginning

First stop on the tour will be Pennsylvania Electric Co., in Johnstown, PA, on May 10. From there, the Caravan will wind its way westward through Pennsylvania, northern Ohio, Michigan, northern Indiana, Wisconsin, Minnesota, Iowa, Nebraska, Kansas, Arkansas, Louisiana, Mississippi, Missouri, Illinois, central Indiana, Kentucky and central and southern Ohio. The 1988 Caravan will end at American Electric Power in Columbus, OH, on June 15.

The 1988 tour initially was slated for the fall, but was moved to the spring at the request of exhibitors, many of whom also participated in the 1987 Caravan.

*EL&P* sponsors the Electric Utility Caravan, which is conducted by Mobile Marketing Services, Inc.

### Dates set

Utility visits are as follows showing dates and whether the visit will be in the morning or afternoon:

**May**

| | | |
|---|---|---|
| 10 | am | Pennsylvania Electric Co. |
| 10 | am | Allegheny Power Service Corp. |
| 10 | am | West Penn Power Co. |
| 10 | pm | Duquesne Light Co. |
| 11 | am | Ohio Power Co. |
| 11 | pm | Centerior Energy Corp. |
| 11 | pm | Cleveland Electric Ill'g Co. |
| 12 | am | Toledo Edison Co. |
| 12 | pm | Detroit Edison Co. |
| 13 | am | Detroit Edison Co. |
| 13 | pm | Consumers Power Co. |
| 16 | am | Indiana & Michigan Elec. Co. |
| 16 | pm | Northern Indiana P.S. |
| 17 | am | Wisconsin Electric Power Co. |
| 17 | pm | Madison Gas & Electric Co. |
| 17 | pm | Wisconsin Power & Light Co. |
| 18 | am | Wisconsin Public Service Co. |
| 19 | am | Superior Water, Light & Power |
| 19 | pm | Minnesota Power & Light Co. |
| 20 | am | Northern States Power Co. |
| 20 | pm | Northern States Power Co. |
| 20 | pm | Lake Superior District Pwr. Co. |
| 23 | am | Interstate Power Co. |
| 23 | am | Iowa-Illinois Gas & Electric Co. |
| 23 | pm | Iowa Electric Light & Power Co. |
| 24 | am | Iowa Public Service Co. |
| 24 | pm | Nebraska Public Power District |
| 25 | am | Omaha Public Power District |
| 26 | am | Kansas City Power & Light Co. |
| 26 | pm | Utilicorp United/Missouri P.S. |
| 27 | am | KPL Gas Service Co. |
| 31 | am | Centel Electric-Kansas |
| 31 | pm | Kansas Gas & Electric Co. |

**June**

| | | |
|---|---|---|
| 2 | am | Arkansas Power & Light Co. |
| 3 | am | Central Louisiana Electric Co. |
| 6 | am | Louisiana Power & Light Co. |

Continued on page 21

# *Communications network connects MAPP utilities, improves efficiencies*

MINNEAPOLIS—The 43 Upper-Midwest electric utility members of the Mid-American Power Pool (MAPP) have given final acceptance to a new communications network. The new network, which replaces a 1967 system that was upgraded with minicomputers in 1976, links all the member utilities and enables them to efficiently send messages for emergency backup, buy and sell surplus power on an hour-to-hour basis, monitor the regional power grid, and transfer data.

According to Duane Hawthorn, MAPP general manager, "With power plants and transmission lines from northern Manitoba to southern Nebraska and Montana to Wisconsin, this network is vital to the successful coordination of their operations." MAPP members serve an area of nearly one-million square miles.

"The network makes MAPP a leader in inter-utility coordination and equips MAPP to move ahead with the latest equipment," said Hawthorn. "A reliable and economical power supply is what we're striving for."

### Faster emergency notification

Using the network, a power system operator can request reserve power from other utilities during an emergency, such as a plant failure. Once an operator requests assistance, the computer automatically notifies all other utilities in the pool of the share of the loss each is expected to make up.

The network also provides an electronic bulletin board of the hour-to-hour price and availability of blocks of power.

A team of engineers from the utilities and the MAPP staff laid out the basic structure of the system and specified what it should do. Digital Equipment Corp. was retained to design and install the network. The hardware consists of two VAX 8650 computers at the MAPP office. Dedicated communications lines connect these to smaller computers, MicroVAXs, located at the control center of each MAPP member utility. Here messages can be viewed on a screen, switched to other computers or printed and distributed within the company.

### Message priority

"A unique feature of the network is the customized software for the message priority system," said Chuck Ruzin, MAPP's lead system analyst for the project. "There are ten levels of priority which assure that critical emergency messages always go first." At other times, the system can be used for electronic mail and data collection.

Power-system data and system-status information needed for coordination can be gathered automatically from members' Supervisory Control and Data Acquisition systems by the MicroVAX computers. This information is periodically retrieved by the central computer for processing. "The intent, wherever possible," said Ruzin, "is to have a machine, rather than a person, gather the data for accuracy and efficiency."

### Modeling studies next

The network will also enable engineers and planners to access databases at member systems and members to transfer files for modeling studies of the power grid. This capability will be implemented in Phase Two of the network's development later this year. In the past, engineers relied on magnetic tapes and paper to transfer data.

During recent field tests, the network was available over 99.8 percent of the time, reported Ruzin. "We think this is an outstanding performance record," he said, "and we believe the network will continue to operate with the necessary high degree of reliability."

### Southern connection

In addition to linking Upper Midwest utilities, the MAPP communications network is connected to utilities to the south and east through networks operated by the Southwest Power Pool (SPP), headquartered in Little Rock, AR, and the Mid-American Interconnected Network (MAIN) that is located near Chicago.

The MAPP system evolved from two earlier teletype networks installed in 1967 and operated by utilities in Iowa, Minnesota, Wisconsin and North Dakota. In 1973, a system using Honeywell minicomputers was added, comparable in power to today's personal computers. It provided the message switching and calculating capability.

"Although this system served MAPP well for 15 years, the larger, more powerful system became necessary to meet today's and tomorrow's greater demands for power supply," said Hawthorn.

## Assn. founder cites trends for Automated Mapping/Facilities Management

SAN DIEGO— The founding president of Automated Mapping/Facilities Management International surprised the Winter Conference of the association by outlining ten trends that will lead to innovation in the graphic information and AM/FM systems.

### Second generation

Chris Harlow, who now is editor of *F-M Automation Newsletter*, said that the 20-year-old industry is only now seeing its second generation of hardware and software.

### Ten trends

His ten trends include:

1. Micro technology is growing up. Soon PCs and engineering workstations will be the primary platforms.

2. Improvements in graphic monitors at the PC level will accelerate development of full-scale PC systems. IBM's 8514 graphics card will lead the way.

3. Supercomputers are becoming even more powerful. Technologies developed in this area will help solve the compute-bound problems of the industry. This will be especially helpful in applying artificial intelligence.

4. AM/FM users are becoming more sophisticated. This will lead to even greater sophistication and more innovation.

5. More large companies are entering the AM/FM industry, including IBM, DEC, PrimeVision, McDonnell Douglas, Xerox, EDS and Apple.

6. Off-the-shelf land bases, raster data, Landsat and user acceptance of less than 2-cm accuracy are becoming commonplace and will continue.

7. Graphic information systems are gaining acceptance in other corporate departments. These include marketing, circulation, transportation, distribution real estate and insurance.

8. Major improvements are occurring in accessing host data. Mainframes are getting smarter and faster; so are communications channels and DASD.

9. Look for use of CD-WORM, generic databases, new venture capital, hybrid conversion and scanning technology, disposable land bases and friendlier software.

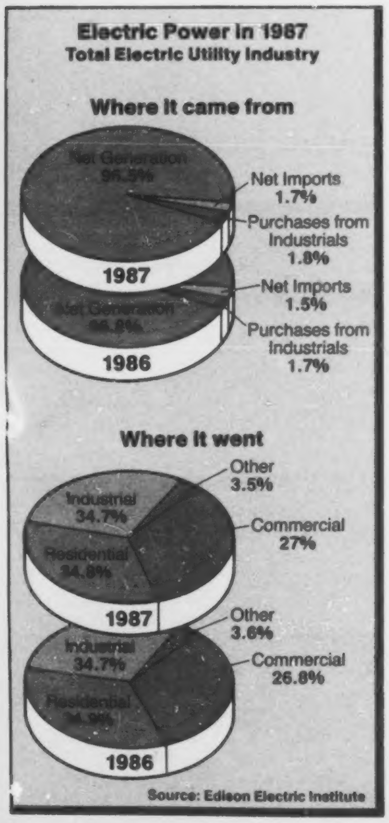
### Humanizing mapping

10. Apple Computer will humanize mapping. They call it Desktop Mapping. More "tool kits" will be available to end users, and Apple will provide users and their bosses with a simple, non-threatening hands-on experience. For the first time, administrators and executives will become graphic information system users and, as a result, will understand the need for large, integrated, geographic information systems.

Harlow formerly was vice president for Information Services, San Diego Gas & Electric Co.

### Focus report

For more on AM/FM systems and applications, and what others see ahead, see the Special Focus report beginning on page 36.



Source: Edison Electric Institute

## Making rain-wet ladders safe

HELSINKI, FINLAND—Fiberglass ladders coated with common car wax show significantly higher resistivities in a wet environment than unwaxed ones.

Karolon Oy tested its fiberglass ladders, with waxed and unwaxed side rails, in accordance with the IEC 855, Paragraph 8.2, wet test methods for foam-filled tubes and solid rods. The wax used was a common, silicone car wax.

### Dry tests

Testing was conducted in ambient conditions at 20°C, 60-percent relative humidity and had a maximum of 1-mA current at 270 kV over a distance of 2 meters.

The ladders then were exposed to 1.4 mm/min of rain, as per IEC 60, except that the water resistivity was 10.0 ohms/meter, rather than the 15.0 ohms/m the test called for. They were placed in different positions to see if this made any difference. It did — the highest currents were found when the ladders were standing upright. These upright values were the ones recorded:

| Voltage (kV) | Current (mA) Samples 1 | 2 | 3 |
|---|---|---|---|
| 10.0 | 1.0 | - | - |
| 26.5 | 2.8 | 0.8 | 1.2 |
| 30.0 | 3.0 | 1.0 | 1.7 |
| 57.5 | 5.0 | 2.8 | 2.8 |

Since the Finnish standard allows for a maximum current of 1 mA, the untreated ladders would only be allowed to be used for working on systems up to 9 kV, maximum.

### Wet tests

After waxing, the same tests under the same test conditions were repeated for the ladders. The resultant maximum permissable working voltage increased to 80 kV, almost nine times that of the untreated ladders.

| Voltage (kV) | Current (mA) Samples 1 | 2 | 3 |
|---|---|---|---|
| 26.5 | 0.08 | 0.08 | 0.15 |
| 30.0 | 0.1 | 0.08 | 0.2 |
| 57.5 | 0.2 | 0.12 | 0.75 |
| 90.0 | - | 1.0 | - |
| 100.0 | 1.0 | - | - |
| 110.0 | - | - | 1.0 |
| 135.5 | 1.7 | 1.8 | 1.15 |

As specified in the safety codes of most countries, notes Karolon, non-conductive ladders should be used in all electrical installation and service work. However, the study shows the importance of keeping ladders well waxed for outdoor work.

## Bethea Electrical Products bought

MUNDELEIN, IL—McLean-Fogg Co. has purchased Bethea Electrical Products, Birmingham, AL, and will operate it under the name of Reliable/Bethea Power Products Inc. Announcement of the purchase was made by Barry McLean, president.

### Complementary lines

McLean-Fogg, a long-time manufacturer of fastenings and engineered components, purchased Reliable Power Products in 1986 as part of its diversification program. The company says the addition of Bethea serves to strengthen and extend the company's electrical product line. Reliable's and Bethea's product lines are complementary, McLean said.

### Pricing

He also reported that although Bethea had operated under severe cost/price pressures over the past few years, the company's products will be priced to sell profitably in the future.

## FINANCIAL PERFORMANCE

**MARK T. HOSKE,** Assistant Editor

# Regulations, low demand hold new spending

BARRINGTON, IL—Regulatory and competitive pressures, excess capacity, and sluggish demand may hold down new spending for plants and equipment by investor-owned utilities during 1988, says The Conference Board, citing statistics compiled from industry groups.

The group said that among major gas and electric utilities, appropriations dropped 9.3 percent to $3.9 billion in the third quarter of 1987, compared to $4.3 billion a year before. Since appropriations indicate future spending levels, the picture for 1988 isn't quite as bright as hoped, The Conference Board noted.

Actual spending, however, increased to $6.4 billion in the third-quarter. (See table, page 3.)

Significant recovery, the CB predicted, won't come until the early 1990s. The CB is a New York-based, non-profit, economic-research group.

Other financial news and highlights follow. Figures listed are for the periods noted, while the percentage increase or decrease shows the change over the same period last year.

**Centerior Energy Corp.** (CLEVELAND)—Quarterly dividend payable in May: 40¢, down 38% from 64¢. Officials said they are confident they could sustain the new annual dividend rate of $1.60. The cut may help with a rate case in which Cleveland Electric Illuminating Co. and Toledo Edison Co. are trying to recoup some of a $3.5-billion net investment in two nuclear plants placed into service last year.

**Citizens Utilities Co.** (STAMFORD, CT)—Dividend payable in May: 33.5¢, or $1.34 annually, an 11.7% increase over the 1987 annual rate of $1.20. This increase is the 43rd consecutive one, cited officials of the electric, telecommunications, gas, water and wastewater utility, which serves some 500 communities in 11 states. Capital expenditures are to increase for 1988 to $88.1 million for expansion and replacement of facilities, with $27.3 million (31%) to be spent on electric facilities.

**Consumers Power Co.** (JACKSON, MI)—CPC is offering $250 million of 8.75% first-mortgage bonds due Feb. 15, 1998, with a "put option" to allow bondholders the chance to redeem them after five years. That provision will save approximately $500,000 per year in interest expense, due to the lower required interest rate. It is the largest single issue of first-mortgage bonds in the company's 102-year history, CPC reported. The proceeds will help repay short-term debt incurred to redeem various issues of preference stock and other high-cost securities.

**General Public Utilities** (PARSIPPANY, NJ)—Net 4th quarter income: $48.2 M, +5%. EPS: 77¢, +4¢. Electric sales: 8939 GWh, +4%. Net 1987 income: $259.1 M, +22.8%. An increase in kilowatthour sales and base-rate increases received in 1986 contributed to the 1987 gain, but was offset slightly by higher operating and maintenance costs.

**Middle South Utilities** (NEW ORLEANS)—MSU subsidiaries: Arkansas Power & Light Co., Mississippi Power & Light Co., New Orleans Public Service Co., and System Energy Resources Inc. all had their security ratings lowered by Moody's Investors Service in late March. The move followed a decision by NOPSI to omit a preferred dividend payment of $750,000, reflecting cash-flow pressures, Moody's said. If these pressures cause NOPSI to file for bankruptcy protection (as some observers believe) or fail in its payments to SERI, owner of the Grand Gulf nuclear plant, a default might be triggered at SERI, with possible negative credit implications for MSU and subsidiaries, said Moody's.

In addition, AP&L Co., based in Little Rock, AR, had its securities ratings lowered earlier in March because of regulatory and other risks related to changed accounting rules and the company's investment in Grand Gulf.

**Philadelphia Electric Co.** (PHILADELPHIA)—Moody's confirmed its debt, preferred-stock, and commercial-paper ratings of PE as a result of the company's management restructuring, which should lead to an orderly resolution of regulatory and financial pressure stemming from the March 1987 shutdown of the Peach Bottom nuclear units. PE is the operator and 42.5% owner. Financial and construction pressure from building Limerick Nuclear Unit 2 intensifies the need for Peach Bottom's startup, Moody's said.

**Texas Utilities Co.** (DALLAS)—Moody's lowered the fixed-income ratings of TU and its operating divisions, anticipating persistent delays in the licensing process for the utility's Comanche Peak Nuclear Station.

During mid-April, the utility plans to offer 5-million common shares to finance its construction program and to repay a portion of short-term borrowings incurred for similar purposes.

IBM would like to
help utility engineers burn
a little less midnight oil.

Think about all the time you *can't* spend designing. The hours you spend waiting for engineering data. The time-consuming re-keying of that information once it arrives. All the time spent on planning, administration and reporting.

Now think about the IBM Engineering Support Center (ESC), an innovative concept that can let you spend more time designing, less time wrestling with your computer system.

The IBM ESC lets you work faster and smarter with a dedicated system that's ideal for compute-bound applications such as load flow and structural analysis.

This IBM concept gives you direct access to data stored on your utility's host system, plus greater control

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JUNE 1988

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VOICE OF THE ELECTRIC UTILITY INDUSTRY

### LATE NEWS

**Middle South Utilities Inc.** plans for its wholly-owned subsidiary, System Energy Resources Inc. to assume management and operating responsibility for MSU's four nuclear units. SERI now operates and is principal owner of Grand Gulf Unit 1. It would operate Arkansas Power & Light's two units, and Louisiana Power & Light's Waterford 3. MSU hopes to strengthen nuclear management, lower operating costs and improve financial performance by the move. Regulatory approvals are expected by the end of the year.

**Green Mountain Power Corp.** has solicited bids for 100 MW from both power suppliers and contractors who would implement load management and pilot conservation programs. GMP is the first Vermont utility and one of the first nationwide to simultaneously solicit bids to compare the relative costs of additional power and conservation. The initiative complements state regulators' least-cost resource goals.

# 1987 was no winner for Top 100 utilities

BARRINGTON, IL—The year 1987 was a real downer for the nation's largest investor-owned electric utilities. After recovering in 1986 from a financially disasterous 1985, last year was a severe disappointment as net incomes and earnings for common stock fell sharply despite small gains in customers and kilowatthour sales.

The brightest aspect of *Electric Light & Power's* 23rd annual survey of the industry's Top 100 Electric Utilities, beginning on page 13, was that the quality of earnings was better.

Per-share earnings and net incomes both fell in 1987. Average common stock earnings of $2.23 were off almost 15 percent and after-tax net incomes dropped 7.4 percent from 1986 levels. The reductions reflect essentially flat revenue growth, commission-mandated rate cuts, increased costs of business, changes in accounting procedures and non-recurring charges. The latter includes write-offs of non-recoverable costs of power plants judged by state commissions to be unneccessary and/or improperly managed during construction.

Per-share earnings were down 31.8 percent from the 1984 high.

Total revenues of the Top 100 Electric Utilities barely increased in 1987, climbing just 0.5 percent, to $150-billion. The flat performance reflects reductions in fuel-adjustment charges, commission-ordered cuts in rates and changes in accounting procedures resulting from federal corporate income tax law revisions. Revenues from utility operations only were up even less.

Revenue growth was disappointing in light of recorded gains in customers served and kilowatthour sales. Sales increased to 2.1-billion kWh, a 3.5 percent increase and a rate that now is accepted as healthy. However, total customers served grew by 2 percent, leaving the actual increase in customer use at just 1.5 percent.

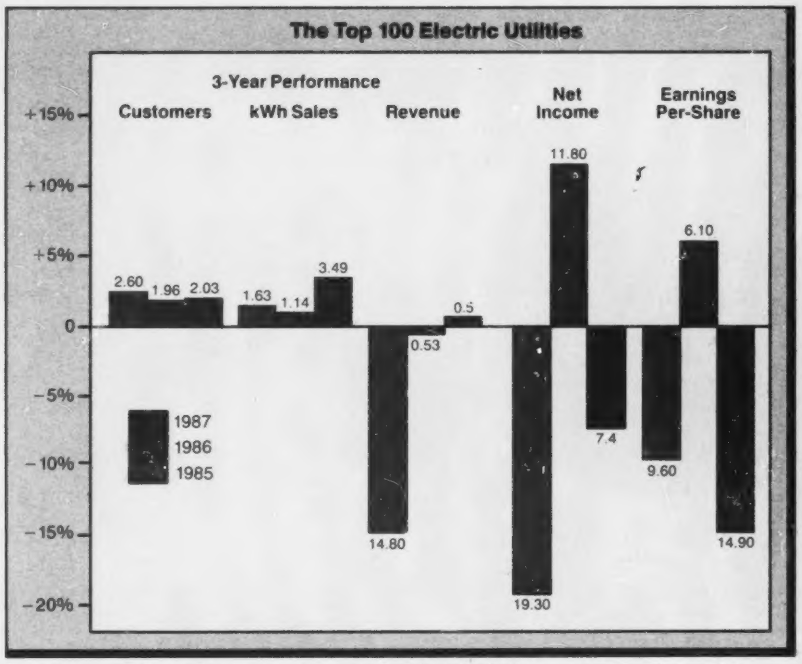
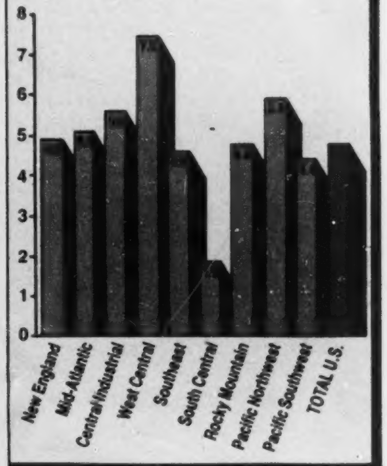


Chart shows relative performances of the Top 100 Electric Utilities over the past three years.

### ELECTRICAL OUTPUT

West Central states (mainly IA, KS, MN, MO, NB, ND, SD) increased net total electric output by 7.2%, leading the 10 geographical regions, according to the Edison Electric Institute. The figures for the contiguous United States are the percentage increases during the 52-week period ending April 23, 1988, compared to the same period in 1987. The South Central region's grew the least, with only 1.9%. Comparing the first 13 weeks of '87 and '88, net U.S. output increased 6.1%.



## RTE 'OKs' offer by Cooper Industries

HOUSTON—RTE Corp. and Cooper Industries Inc. have agreed to a reorganization under which Cooper Power Acquisition Corp., a wholly owned Cooper subsidiary, would acquire RTE at a net cash price of $45 per share for all outstanding shares.

RTE is one of the Big Three suppliers of distribution transformers for the electric utility industry, as well as a variety of other electrical and electronic products for industry. Cooper Industries is a large diversified manufacturer, and the parent of McGraw-Edison Company.

As part of a May 9 decision, RTE's board recommended unanimously that shareholders accept the offer, which amounts to about $330 million.

Cooper outpriced a Mark IV Industries Inc. offer of $36-per-share, increased from an April bid of $33. Mark IV, based in West Amherst, NY, is a aerospace and defense products manufacturer.

Brookfield, WI-based RTE had recommended rejection of both Mark IV offers and sought alternatives after the first one. RTE Treasurer Douglas Haag called the $36-per-share offer inadequate.

Cooper's offer ex-

Continued on page 32

## State/LILCo negotiate

### *PASNY power; kill Shoreham; rates up*

HICKSVILLE, NY—Long Island Lighting Co. may soon announce a deal with the state to close its Shoreham nuclear plant, in exchange for a rate plan of 5-percent annual increases from 1989 to 1998, said Gov. Mario Cuomo. Also, the state's New York Power Authority would assist in financing, building and operating gas turbines and baseload generating plants to provide added LILCo power requirements.

Meanwhile, the Long Island Power Authority continues its takeover bids for LILCo, having offered $12 a share, raised from $10 and $8.75.

LILCo officials rejected two lower LIPA offers. The latest offer was to expire May 31. To apply further pressure, LIPA nominated three candidates for LILCO's nine-director board, but if proxy vote counting mirrors sentiments expressed at the May 17 annual meeting, LIPA's attempt at board seats or a takeover would fail.

LILCo continued to pursue licensing, encouraged by recent positive NRC board decisions. Chairman William Catacosinos reaffirmed his commitment to Shoreham, but is continuing negotiations with the state. Cuomo has said that under its settlement plan, rates should be comparable to what LIPA could offer, after a management reorganization, and a Shoreham shutdown.

Details of talks with the state have not been released, though Catacosinos said that LILCo would discuss options with the community soon.

"It could go in any direction at this point," said Rumelia F. Lodia, utility analyst with Duff & Phelps Inc. in Chicago. Lodia said that after LILCo's January writeoffs, its book value was near $18 billion.

Lodia said she anticipates shareholders to ask LILCo officials about the possible sale at the May 17 annual meeting.

LIPA, locally controlled, said after the friendly offers that it would consider a

Continued on page 25

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# NEWS BRIEFS

JILL MINNER, Assistant Editor

## PP&L's Susquehana 2 sets GE record

The Susquehana 2 nuclear plant achieved a 93.5-percent capacity factor in 1987, making it the 'best performing' General Electric-supplied boiling water reactor, according to GE. Unit 2 began commercial operation in 1985. Owners of the Susquehana station include Pennsylvania Power & Light Co. (90 percent) and Allegheny Electric Cooperative (10 percent).

## Delays at Braidwood 1, and Byron-2 increased costs, say audit firms

Auditors said that delays at Commonwealth Edison Company's Braidwood 1 and Byron 2 nuclear plants increased costs by $872 million and $400 million respectively. A rate base exclusion of $278 million was recommended for Braidwood 1, and an exclusion of between $119 million and $181 million was recommended for Byron 2. The audit firms, O'Brien-Kreitzberg & Associates, Inc. and Arthur Young and Co., also said that a portion of the increased costs were offset by other economic benefits to customers. Commonwealth Edison said it disputes the auditors' recommendations and plans to file independent testimony supporting its position. At press time, the Illinois Commerce Commission had not yet decided whether the audits should be considered as a separate matter or worked into the current rate proceeding (see p. 28).

## PNM to compromise on restructuring plan

Public Service Co. of New Mexico (PNM) has filed a settlement offer with the New Mexico Public Service Commission, as a compromise to its company restructuring plan. PNM said it would support a settlement plan which calls for: an immediate $19-million rate decrease; complete exclusion of the Palo Verde nuclear generating station from rates to its New Mexico customers; a 10-year phase-in of 147 MW of additional power from the San Juan generating station; and reorganization of the utility under a holding company structure. PNM also said that after the initial rate cut, it would need small rate increases at the end of 18 and 36 months. At press time, the proposed settlement was awaiting commission approval.

## California LMUD buys PG&E power for sale to CP National customers

California's Lassen Municipal Utility District is now supplying power to 10,000 former CP National electric customers, according to the American Public Power Association (APPA). The Lassen MUD, created in November 1986, recently paid CP National $19.9 million for electric facilities in three California counties. APPA said the new municipal utility will purchase its power wholesale from Pacific Gas & Electric Co., and that customers will enjoy a 50 percent reduction in electric rates.

## Puget Power and WWP sign power contract

Puget Sound Power & Light Co. has signed a 15-year contract with Washington Water Power Co. (WWP) for the purchase of an average of 75 MW per year. Puget Power's Director of Power Planning, Rich Lauckhart, said the long-term contract gives WWP a market for its power surplus while providing Puget Power with energy for its growing customer base. "What's unusual about this contract is the pricing. Rather than paying the cost of power generated by Washington Water Power's most expensive resource, we're paying the average cost of its generating and transmission facilities," added Lauckhart.

## PCI forms subsidiary

Potomac Capital Investment Corp. (PCI) announced that it has formed a new subsidiary, American Energy Corp., to pursue investments in alternative energy projects. Peter H. Benziger will serve as CEO of American Energy and William J. Sim will serve as president. Benziger is senior vice president-generation for Potomac Electric Power Co. (PEPCO) and Sim was previously the utility's manager of generating construction. PCI is a wholly-owned subsidiary of PEPCO.

## Centerior names new management team

Richard A. Miller

Robert J. Farling

A new management team has been announced at Centerior Energy Corporation. Richard A. Miller, president of Centerior, will serve as CEO and Robert J. Farling will take over as president. Lyman C. Phillips succeeds Farling as president of Cleveland Electric Illuminating Co., a subsidiary of Centerior. Murray R. Edelman will replace Phillips as president of Toledo Edison, another of Centerior's subsidiaries. According to the company, these and other changes were made to help Centerior through a difficult period of inadequate rate increases and a reduction in the common stock dividend. Other changes include an ongoing cost-cutting program and a financial restructuring.

## EEI honors utilities for affirmative action work

The Edison Electric Institute recently awarded seven electric utilities for "programs demonstrating outstanding achievement and commitment to affirmative action." Utilities receiving top honors included: Puget Sound Power & Light Co. for its *Veterans' Assistance Program*; Cleveland Electric Illuminating Co. for its *Enabling the Disabled* program; and Public Service Electric and Gas Co. for its *Women Working Technical Program*. Awards given for 'meritorious achievement' went to: Tampa Electric Co., New England Electric System, Duke Power Co., and Pacific Gas and Electric Company.

## Disaster Congress & Expo to be held in Nov.

The First International Disaster Congress & Exposition will take place November 9-11 in Chicago's McCormick Place. According to organizers Kotch & Poliak, Inc., the event will focus on methods and products for coping with five major disaster areas: natural phenomena, deliberate violence, technological hazards, human contagion and government conduct. For more information contact: Kotch & Poliak, 708 Third Ave., New York, NY, 10017; (212) 557-6950.

## Palo Verde sets second 1988 generating record

Arizona Nuclear Power Project (ANPP) announced that, for the second time this year, its Palo Verde 3 nuclear unit has set an industry generating record. Unit 3 produced 995,400 MWh of electricity during March, surpassing the record set by Palo Verde 2 in October 1986. ANPP said Unit 2 had generated 987,300 MWh of electricity.

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**EL&P readers whose responsibilities include both Generation and Transmission/Distribution receive both technology sections. Other readers receive the technology section that applies to their respective area of responsibility. The Generation edition is indicated by a single dot (·) in the upper right corner of page 1; the T/D edition carries two dots (··). All readers receive EL&P's industry news section.**

# Voters may close Rancho Seco; Duke to operate SMUD plant?

**Mark T. Hoske**
**Assistant Editor**

SACRAMENTO—The vote looks like a close one!

On June 7, Sacramento Municipal Utility District voters may decide to permanantly pull the plug on the Rancho Seco nuclear power plant, scheduled in June for 40-percent capacity operation after two years and $400 million in improvements.

Or, they may approve indefinite operation. Or they could allow operations for 18 months under strict conditions, including a later option to close it or tranfer ownership in order to reduce the district's financial risk *(EL&P,* April, p.3). If one of these options does not appear a clear winner out of the two separate referendum votes, the matter may end up in court.

Continued on page 24

# *Mergers could save consumers $3.65B yearly*

NEW YORK—Consumers could save at least $3.55 billion annually—$54.13 each per year—if 136 of the nation's major investor-owned electric utilities consolidated into 41 larger, more efficient companies, according to a 82-page study released by the Wall Street investment firm of Shearson Lehman Hutton.

The mergers could also generate an additional, one-time, $15.9 billion for investors if utilities were to liquidate their surplus assets at the current rate of 1.5-times book value, says Edward J. Tirello Jr., senior vice president of equity research, who directs utility analysis for the brokerage firm. Tirello commissioned the engineering-analysis study and believes it to be the first of its type.

"We've been saying for some time that we believe the competitive forces re-

Continued on page 17

**Possible Consolidation Groups**

**CAROLINA GROUP**
Carolina Power & Light
Nantahala Power & Light
Duke Power
South Carolina Electric & Gas

**NEW JERSEY GROUP II**
Metropolitan Edison
Pennsylvania Electric
Pennsylvania Power & Light
UGI Corp.

**ARIZONA GROUP**
Arizona Public Service
Tucson Electric Power

**COLORADO GROUP**
Western Division, Centel
Cheyenne Light Fuel & Power
Public Service Company of Colorado

**DAKOTA GROUP**
Montana-Dakota Utilities
Northwestern Public Service
Otter Tail Power

**EASTERN GROUP**
Blackstone Valley Utilities
Concord Electric
Fitchburg Gas & Electric Light
Brocton Electric
Exeter & Hampton Electric
Newport Electric

**FLORIDA GROUP**
Florida Power & Light
Florida Public Utilities
Tampa Electric

**ILLINOIS GROUP**
Central Illinois Light
Central Illinois Public Service
Illinois Power

**INDIANA GROUP**
Indianapolis Power & Light
Public Service Company of Indiana
Southern Indiana Gas & Electric

**IOWA GROUP**
Iowa Electric Light & Power
Iowa-Illinois Gas & Electric
Iowa Power and Light
Iowa Public Service
Iowa Southern Utilities

**KANSAS GROUP**
Kansas Gas & Electric
Kansas Power & Light
Western Power-Centel

**KENTUCKY GROUP**
Kentucky Utilities
Louisville Gas and Electric
Old Dominion Power

**LOUISIANA GROUP I**
Central Louisiana Electric
Gulf States Utilities (LA portion)

**LOUISIANA GROUP II**
Gulf States Utilities (Texas Portion)
Houston Industries Light & Power

**MAINE GROUP**
Bangor Hydro-Electric
Central Maine Power
Maine Public Service

**MICHIGAN GROUP**
Alpena Power
Consumers Power
Detroit Edison
Northern Indiana Public Service

**MIDSOUTH GROUP**
Arkansas Power & Light
Louisiana Power & Light
Mississippi Power & Light
New Orleans Public Service

**MINNESOTA GROUP**
Interstate Power
Minnesota Power & Light
Northern States Power (combined)
Superior Water, Light & Power

**MISSOURI GROUP I**
Empire District Electric
UtiliCorp United

**MISSOURI GROUP II**
Kansas City Power & Light
St. Joseph Light & Power
Union Electric

**NEW ENGLAND GROUP**
Massachusetts Electric
Narragansett Electric
New England Electric
Public Service Company of New Hampshire

**NEW JERSEY GROUP I**
Atlantic City Electric
Jersey Central Power & Light
Public Service Electric & Gas

**NEW YORK NORTH GROUP I**
New York State Electric & Gas
Orange and Rockland Utilities
Rochester Gas & Electric
Rockland Electric*

**NEW YORK NORTH GROUP II**
Niagara Mohawk Power

**NEW YORK SOUTH GROUP**
Central Hudson Gas & Electric
Consolidated Edison Company of New York

**NORTHEAST GROUP**
Boston Edison
Holyoke Water Power
Connecticut Light & Power
United Illuminating
Western Massachusetts Electric

**OHIO GROUP I**
Appalachian Power
Cincinnati Gas & Electric
Dayton Power & Light
Indiana and Michigan Electric
Kentucky Power
Kingsport Power
Michigan Power
Ohio Power
Union Light, Heat and Power
Wheeling Electric

**OHIO GROUP II**
Cleveland Electric Illuminating
Dusquesne Light
Ohio Edison
Pennsylvania Power
Toledo Edison

**PACIFIC NORTHWEST GROUP I**
Black Hills Power and Light
Pacific Power & Light
Utah Power & Light
Portland General Electric
Puget Sound Power & Light

**PACIFIC NORTHWEST GROUP II**
Idaho Power
Montana Power
Sierra Pacific Power
Washington Water Power

**PACIFIC NORTHWEST GROUP III**
California Public Utilities
Pacific Gas and Electric

**PHILADELPHIA GROUP**
Conowingo Power
Philadelphia Electric

**POTOMAC GROUP**
Baltimore Gas & Electric
Potomac Electric Power
Delmarva Power & Light

**SOUTHERN CALIFORNIA GROUP**
Nevada Power
Southern California Edison
San Diego Gas & Electric

**TEXAS GROUP I**
El Paso Electric

**TEXAS GROUP II**
Central Power & Light
Public Service Co. of Oklahoma
Southwestern Electric Power
Southwestern Public Service
Texas-New Mexico Power
West Texas Utilities

**TEXAS GROUP III**
Initially, Texas-New Mexico Power, which was ultimately merged into Texas Group II.

**TEXAS GROUP IV**
Southwestern Electric Service
Part of Texas - New Mexico Power
Texas Utilities

**VERMONT GROUP**
Central Vermont Public Service
Green Mountain Power

**VIRGINIA GROUP**
Monongahela Power
Potomac Edison
Virginia Electric and Power
West Penn Power

**WISCONSIN GROUP**
Madison Gas & Electric
Wisconsin Electric Power
Wisconsin Power & Light
Wisconsin Public Service

Source: Shearson, Lehman, Hutton's "Electric Utilities: The Case for Consolidation."

**Commission Cost Disallowances For Selected Operating Nuclear Plants**

| Company | Plant | Cost/kW | % Disallowance | Commission |
|---|---|---|---|---|
| NMK, CNH, LIL, RGS, NGE | Nine Mile Pt-2 | $5501 | 36% | NY |
| GTU | River Bend | 4000 | 35 | LA |
| ATE | Hope Creek | 4000 | 9 | NJ |
| PEG | Hope Creek | 4000 | 11 | NJ |
| SO | Vogtle-1 | 3650 | 15 | GA |
| PE | Limerick-1 | 3500 | 12 | PA |
| CONN L&P, UIL | Millstone | 3260 | 9 | CT |
| CTP | Millstone | 3260 | 15 | ME |
| W. MASS | Millstone | 3260 | 15 | MA |
| DTE | Fermi-2* | 2796 | 13 | MI |
| KGE, KLT | Wolf Creek | 2600 | 10 | MO |
| KGE, KLT | Wolf Creek | 2600 | 10 | KS |
| MSU | Waterford | 2572 | 10 | LA |
| SCE | Palo Verde | 2500 | 2 | CA |
| UEP | Callaway | 2300 | 17 | MO |
| CWE | Byron-1 | 2200 | 4 | IL |
| SDO, SCE | San Onofre | 2050 | 6 | CA |
| PPL | Susquehana-1 | 1960 | 12 | PA |
| PPL | Susquehana-2 | 1960 | 35 | PA |

Source: Duff & Phelps Inc.

*Costs-to-Date

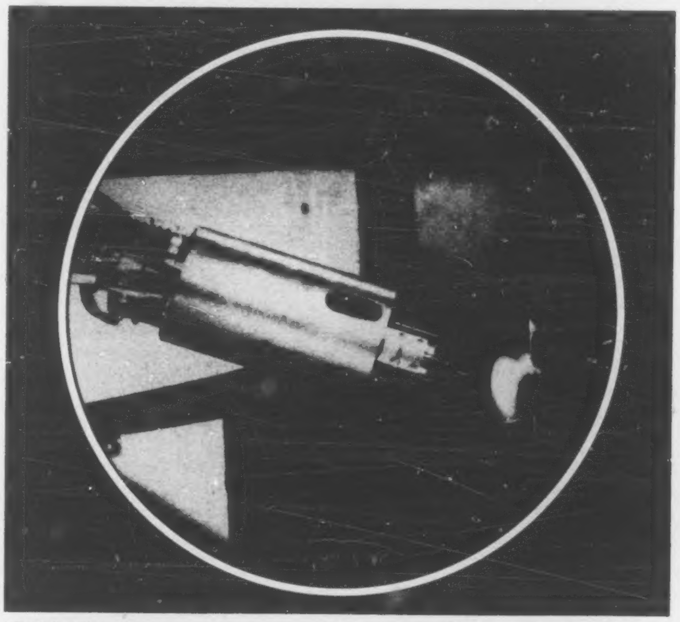
# *Flexibility is key to utility's success*

CHICAGO—Flexibility of investments, fuel mix and supply planning, as well as the ability to operate within the regulatory/legal environment and improve management are now key determinants of success for electric utilities, says a leading analyst.

Competition will not lead to a breakdown of the industry, as some suggest, according to Linda S. Caldwell, utility analyst at Duff & Phelps Inc. Although the rules have changed slightly, the game is the same—management's biggest challenge will be dealing with the regulatory environment, she claims.

Continued on page 8

IN A TIGHT SPOT...



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# COMMENTARY

## Consolidations and mergers: Will rhyme or reason prevail?

**We are approaching the time, it is said, when the combined weights of internal debt, over- or under-capacities, limited rates of return and a variety of other problems will cause utilities to consider the benefits of mergers or other consolidations. In fact, says Shearson Lehman Hutton's Ed Tirello (see article on previous page), that time is already here.**

**Utility customers could profit to the tune of $3.6 billion per year or more if the nation's investor owned electric utilities should consolidate into some 41 larger, more-efficient operating companies. Investors could pocket another $16 billion if those consolidated utilities would sell off duplicated, surplus assets.**

**It's tough to argue with such suggestions. Certainly, where a merger or consolidation of two or more operating companies truly makes good operating and economic sense, who can oppose it? And why would anyone want to?**

**But cases of such clear-cut benefits are not the norm. More often, for every benefit that would result from a merger, there is a corresponding disadvantage. The final evaluation depends on the relative weightings applied to both pros and cons.**

**In the real world, financially weak companies may have far more to gain than the larger, stronger company they'd like to merge with, and may have to pay a large price for the added security. Utilities with strong customer and sales growth can cut their own deals with over-capacitied utilities. Strengths and weaknesses are all relative, and we all know how difficult some relatives can be to deal with.**

**Ultimately, the people who make merger decisions are not economists, financial analysts, or regional planners. Nor do they make such far-reaching decisions altruistically. They tend to be specialists in one thing, running a company...one company...their company...and they see things in terms of how they themselves will be affected.**

**Management ego is tough to deny. It's what makes chief executive officers decision-makers. And its going to be the stumbling block in the way of many potential mergers. The question of who will run the show cannot be ignored in any merger negotiation if the considerations are to be fruitful.**

**All this is not to say that Tirello is wrong in predicting that competitive forces may lead to widespread consolidations. It may happen. But if it does, it would seem to us to be more likely after utilities have taken greater advantage of the benefits of existing pooling arrangements, closer coordination and cooperation in planning, construction and operation, where each CEO remains in charge of his own corporate destiny.**

## What we're looking for is rarer than a double-headed four-leaf clover

**So what's so rare? I'll tell you. It's an engineer with several years of transmission or distribution experience, the ability to communicate clearly and succinctly and a desire to become a writer and editor. We're looking for someone with these basic qualities to join our staff, where he or she will visit utilities, architect-engineers and manufacturers, attend industry meetings and conferences and develop news and technical articles on transmission and distribution subjects. We don't expect a trained editor...we'll provide the right person with any training needed. Location is in the suburban-Chicago area.**

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*Robert A Lincicome, Editor-in-Chief*

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# 1988 demand growth may exceed 4.5%, says study

SAN DIEGO—Early indications show 1988 electric demand growth will likely meet and may exceed the 4.5-percent increase of 1987, says John Sillin, of the San Diego-based Management Analysis Co. Probability increases as manufacturing realizes significant production increases due to improved competitiveness in both U.S. domestic and overseas markets, he said.

The significant decline in constant-dollar electricity prices since 1982 will reinforce the effects of economic growth and spur higher levels of electric demand, Sillin predicted in an April report called: "Updating the High Electric Growth Scenario: 1987 in review and the outlook for 1988."

Sillin co-authored a 1983 paper that proposed an average annual growth rate scenario at 4 percent from 1983 to 1990, about twice what government and other forecasters then predicted.

"1988 will likely be the year that a definitive judgement is reached regarding the high electric growth scenario" of four percent or higher, Sillin said. Growth in 1987 moved the 1983-90 growth curve closer to Sillin's scenario.

However, a slower 1988 GNP growth, combined with little or no increase in manufacturing output, will lead the figures toward the moderate 2-percent growth predicted by the Department of Energy and the National Energy Reliability Council. (See related graph.)

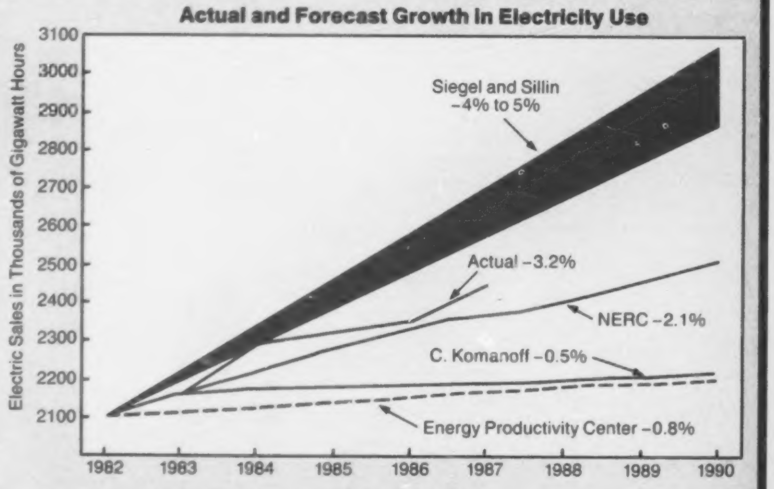
"But if economic growth remains modest at about 3 percent, and industrial production grows as it did in 1987, count on the high electric growth scenario occurring," Sillin said.

If electric growth remains strong in '88, electric reliability will become a greater concern in many regions, according to Sillin. New England and the Mid-Atlantic states could see more frequent voltage reductions or more severe measures than in 1987. Other regions experiencing strong demand growth such as the Southeast and Southwest may experience similar conditions.

Some more key points Sillin cites for 1988 include:

- The start of a period when the large supply claims by alternative energy advocates and independent power producers will be tested.
- Strong Canadian economic growth will parallel U.S. growth, testing provincial utilities' ability to meet rapidly growing U.S.-Canadian load growth.
- Advocates of demand management will see if their programs can achieve claimed benefits of reducing or controlling load when economic and electric load-growth conditions are robust.
- Owners and operators of underperforming assets—including nuclear plants—will be under increased pressure to resolve technical or managerial problems, or transfer ownership to entities that can.
- "Finally, regulators will come under increasing pressure to realize that the preeminent issue facing electric utilities and their customers isn't controlling costs (the decline in real electric prices is clear proof that this battle has been won), but assuring that adequate and economic supplies of electric power are available to satify a growing, robust economy," he concluded.

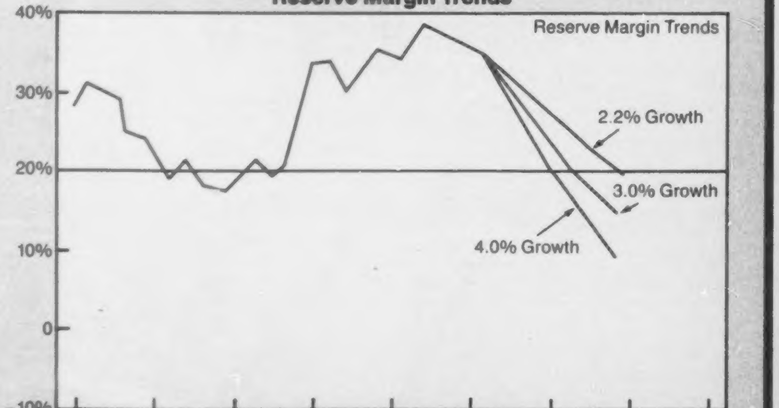
**Actual and Forecast Growth in Electricity Use**



**Electric sales: per DOE/EIA Monthly Energy Review, "Total Sales."**

**Source: Management Analysis Company's "Updating the High Electric Growth Scenario: 1987 in Review and the Outlook for 1988."**

**Historical and Projected Electric Capacity Reserve Margin Trends**



**Note: Historically, a National Reserve Margin of approximately 20% has been identified as that which is consistent with reliable electric service, for some regions a reserve margin as low as 15% and as high as 25% may be more appropriate, reflecting regional grid capabilities and peaking phenomena.**

**Source: Management Analysis Company's "Updating the High Electric Growth Scenario: 1987 in Review and the Outlook for 1988."**

# Autodesk drops bomb onto MS-DOS

CHICAGO—First at a press conference and then in a general session at a meeting held in early May, an executive of Autodesk Inc. declared, "MS-DOS is dead...it just doesn't know it yet. OS/2 is taking its place right now."

Daniel Drake, executive vice president of Autodesk, repeated his definitive statement about the most widespread operating system for microcomputers when describing his company's newest software product for the machines, its Release 10 of AutoCAD, during a session at Expo '88. (Expo '88 was one of the concurrent conferences and shows held under the umbrella of DesCon '88.)

Although Release 10 uses MS-DOS, Drake noted that it will be the last AutoCAD product to do so—all future programs in this most-popular of the computer-aided design (CAD) applications software for desktop computers and workstations will be in the newer OS/2 operating environment. With its widespread use in the CAD world, AutoCAD's switch to OS/2-based programming is as important to designers as IBM's original announcement of OS/2 was to the world of microcomputers.

In fact, Drake's pronouncements signal the beginning of the next phase of implementing OS/2. There was speculation in the computer community that the system might not take hold. But with such an important software house now backing the new system, many of those doubts are being laid to rest.

Drake further announced that AutoCAD Release 11 will be out within the year, and it will use OS/2 exclusively. He noted, however, that the company will continue to support its older versions using MS-DOS and its equivalents.

### Another side

Leonard Rand, executive vice president of Intergraph Corp., for one, stated that he was very impressed with the announcement. In an interview with *EL&P*, he stressed the industry-wide importance of Autodesk's move. And this, despite the fact that Intergraph's newest products for architecture/engineering/construction (A/E/C) applications announced at A/E/C '88, another colateral conference/show in DesCon '88, use the Unix operating system on VAX minicomputers. And despite the fact that his company was encouraging third parties to implement its software on micros with a DOS version of its MicroStation package.

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from page 3

## Flexibility is key...

As an example of varied regulatory pressure, Caldwell cited disallowances ranging from 2 to 36 percent for 24 companies owning selected nuclear power plants (see chart page 3).

Caldwell said factors that seem to affect regulatory disallowances include the size of rate increases requested, the relative cost of power within the state, and the level of public opposition to the plant and the increase.

Surprisingly, no correlation appeared between the cost of the plant and the amount of the disallowance.

Although Caldwell said cogeneration will provide 5 to 8 percent of all capacity by the year 2000, she pointed out that the majority of capacity growth in the 1990s will come from utilities. More consistent treatment by regulators would provide utilities with the needed confidence for baseload construction.

More and more, competition emphasizes pricing and marketing, she said. Many utilities have responded to customers' needs so they can ward off power purchases from outside the system or self-generation by customers, but more effort by utilities are needed.

Unbundling utility resources may work for a few, but is not likely to be a widespread trend, Caldwell contended. Companies generally don't care to sell their control of transmission capability and still feel a strong obligation to serve on the distribution side.

Although some have undergone restructuring to facilitate diversification, 80 percent of electric utilities lack nonutility holdings in excess of 5 percent of total assets. Utilities will become more aggressive in expanding in areas with which they are familiar, such as mining, investment services, coal transportion or real estate, she said.

The 1986 leaders in diversification were Minnesota Power, with 27 percent of assets providing 65 percent of income; Montana Power, with 13 percent providing 43 percent; Black Hills Corp. with 15 percent and 40 percent; Pacifi-Corp at 41 percent and 38 percent; Tucson Electric, with 21 percent and 33 percent; Midwest Energy at 15 percent and 25 percent; and Potomac Electric with 18 percent and 16 percent.

Although mergers and acquisitions of neighboring utilities may enable some of them to improve their fuel mix and operate more efficiently (leading to lower electricity rates and higher returns), Caldwell doesn't see any widespread trend in this direction. (See merger story, page 3.)

Caldwell provided these views at an April Duff & Phelps Investment Conference.

# 1987 rough for Top 100 utilities: 23rd annual report

**Robert A. Lincicome**
**Editor-in-Chief**

A number of individual investor-owned electric utilities may have enjoyed the fruits of their labors in 1987, but for the Top 100 Electric Utilities as a whole, 1987 ranks as the second worst since *EL&P* launched its series of annual financial reports 23 years ago.

Six utilities reported financial losses for the year and nearly half the Top 100 posted reductions in common stock earnings. More than 40 percent of the companies suffered lower net incomes.

The bright spot, so to speak, was kilowatthour sales performance, which increased 3.5 percent. While this is only half the historic growth rate up to the Arab oil embargo, it is a healthy rate for recent years. It must be realized, however, that the number of customers served increased by 2.0 percent and was responsible for a large portion of the kWh sales growth.

The fact that power sales were up makes the financial performance all the more disappointing. Utilities have generally finished their ambitious construction programs launched in the late 70s and early 80s. With the exception of a handful of utilities hard hit by unrecoverable costs and high expenses associated with incomplete or recently completed nuclear plants, the Top 100 companies have returned to an operational, non-expansionary mode. Company efforts in 1987 were directed toward catching up with maintenance and housekeeping functions that had been postponed in previous expansionary years. Considerable attention was focused on improving productivity by increasing work output with fewer people. Many utility executives said that they were addressing the needs of shareholders. And considerable effort was devoted to improving the quality of earnings, even where earnings were reduced from 1986.

Obviously, what was done and what was said weren't enough. Commission orders to reduce rates, write-offs of nonrecoverable investment in nuclear and other plant facilities, unusual and nonrecurring expenses, required changes in accounting procedures and reductions in allowable rates of return combined to produce a 7.4-percent decrease in net income from 1986. Moreover, the 7.4-percent decline in net income included the positive effect of non-utility operations of holding companies. Net incomes from utility-only operations fell 9.2 percent.

Following is a discussion of the performances of the Top 100 Electric Utilities in various classifications of activity. Information was derived from returns to *EL&P*'s annual survey.

Holding companies and companies operating like holding companies, although not qualifying in a legal sense, are indicated by an * in the tables following.

It should be remembered that rates of growth can be misleading. Utilities recovering from a poor year often produce unusually high growth rates that may make their performance appear substantially better than other utilities producing healthy, but unspectacular, growth rates based on previous years of strong consistent growth.

### Customer base grew

Total electric customers served by the Top 100 Electric Utilities increased by 2 percent in 1987, to 79.3 million. At the same time, the number of gas customers served by the Top 100 declined 1.9 percent, to 18 million.

Utilicorp United, the holding company formed by Missouri Public Service, posted the highest individual customer growth through its aggressive program of acquisition. Utilicorp United increased its customer base by 60.6 percent in 1987.

Largest normal customer growth occurred in three areas of the country. The first two—Florida and the Southwest (Nevada, southern California and Arizona) were expected. Surprisingly, rapid customer growth also took place in northern New England...specifically, New Hampshire and Vermont.

### kWh sales better

With customer growth a solid 2 percent, largely reflecting the increase in the number of residential customers, and with industrial activity remaining in an upward mode, sales could be expected to increase in 1987, and they did.

Total kilowatthour sales by the Top 100 increased at what has come to be considered a healthy 3.5 percent. Total electric sales in 1987 were 2.1-trillion kWh, as compared with sales of just over 2 trillion in 1986.

Compared to sales of 1982, 1.8-trillion kWh, growth in 1987 was solidly ahead of the average annual rate of change in kWh sold over the previous five years. Average annual growth in kWh sales from 1982 through 1986 was 2.2 percent.

In 1987, residential and commercial sales both increased in excess of 4.0 percent, while industrial sales rebounded to a 3.8-percent growth rate after being essentially flat or down over the past several years.

Eighty-four companies reported increases in kWh sales, up from 62 companies in this catagory a year ago. In addition, 18 reported increases greater than the historic industry growth rate of 7.0 percent that applied until the Arab oil embargo.

The largest kWh sales increase, 38.6 percent, was posted by Utilicorp United, on the strength of its acquisitions of small utilities. Among those whose growth was based on operations, not acquisition, Minnesota Power (18.6 percent), Midwest Energy (18.4 percent), and Green Mountain Power (18.4 percent) were leaders.

The median kWh sales growth rate in 1987 was 4 percent, compared to the overall average rate of growth of 3.5 percent, and was well above the 1986 median kWh sales growth rate of 1.9 percent.

The 10 largest sellers of electricity were the same in 1987 as in 1986, but there was one switch in ranking.

Continued on page 14

### EARNINGS TABLE

| Company | Rank | % Change From 1986 | 1987 Earnings Per Share, $ | 1986 Earnings Per Share, $ |
|---|---|---|---|---|
| Public Service of Colorado | 1 | 2246.15 | 3.05 | 0.13 |
| Kansas Gas & Electric | 2 | 1571.43 | 2.34 | 0.14 |
| Portland General* | 3 | 620.59 | 2.45 | 0.34 |
| Public Service of Indiana | 4 | 534.04 | 4.08 | -0.94 |
| Washington Water Power | 5 | 244.78 | 2.31 | 0.67 |
| CMS Energy* | 6 | 190.54 | 2.15 | 0.74 |
| Philadelphia Electric | 7 | 130.69 | 2.33 | 1.01 |
| Utah Power & Light | 8 | 61.49 | 2.39 | 1.48 |
| Atlantic Energy* | 9 | 34.33 | 4.03 | 3.00 |
| Public Service Enterprise Group* | 10 | 34.21 | 2.55 | 1.90 |
| Detroit Edison | 11 | 25.97 | 3.25 | 2.58 |
| Northeast Utilities* | 12 | 25.60 | 2.11 | 1.68 |
| TNP Enterprises* (Tex-NM Power) | 13 | 25.52 | 2.41 | 1.92 |
| Eastern Utilities Associates* | 14 | 22.70 | 3.46 | 2.82 |
| General Public Utilities* | 15 | 22.62 | 4.12 | 3.36 |
| Puget Sound Power & Light | 16 | 22.41 | 2.13 | 1.74 |
| Kentucky Utilities | 17 | 20.28 | 1.72 | 1.43 |
| Nevada Power | 18 | 17.54 | 2.01 | 1.71 |
| IE Industries* | 19 | 16.43 | 2.48 | 2.13 |
| Central Maine Power | 20 | 16.23 | 1.79 | 1.54 |
| Sierra Pacific Power | 21 | 13.41 | 2.03 | 1.79 |
| TECO Energy* | 22 | 12.72 | 1.95 | 1.73 |
| Pinnacle West Capital* | 23 | 11.84 | 3.40 | 3.04 |
| Iowa-Illinois Gas & Electric | 24 | 11.51 | 4.36 | 3.91 |
| Baltimore Gas & Electric | 25 | 10.16 | 3.47 | 3.15 |
| Central Louisiana Electric | 26 | 9.32 | 3.52 | 3.22 |
| Dominion Resources* | 27 | 9.13 | 4.54 | 4.16 |
| Duke Power | 28 | 8.91 | 4.40 | 4.04 |
| Wisconsin Energy* | 29 | 7.59 | 2.55 | 2.37 |
| Southern Indiana Gas & Electric | 30 | 7.55 | 3.42 | 3.18 |
| Kansas City Power & Light | 31 | 7.50 | 3.01 | 2.80 |
| Green Mountain Power | 32 | 7.35 | 2.63 | 2.45 |
| Savannah Electric & Power | 33 | 7.33 | 2.05 | 1.91 |
| Pennsylvania Power & Light | 34 | 7.10 | 3.32 | 3.10 |
| FPL Group* (FP&L) | 35 | 6.90 | 3.10 | 2.90 |
| Tucson Electric Power | 36 | 6.45 | 4.95 | 4.65 |
| SCANA Corporation* (SCE&G) | 37 | 5.61 | 3.20 | 3.03 |
| Central & South West* | 38 | 4.53 | 3.92 | 3.75 |
| Pacificorp | 39 | 4.35 | 3.60 | 3.45 |
| Wisconsin Public Service | 40 | 3.94 | 2.11 | 2.03 |
| Consolidated Edison | 41 | 3.76 | 4.42 | 4.26 |
| Oklahoma Gas & Electric | 42 | 3.64 | 2.85 | 2.75 |
| Southern California Edison | 43 | 3.35 | 3.39 | 3.28 |
| Empire District Electric | 44 | 3.15 | 2.95 | 2.86 |
| Louisville Gas & Electric | 45 | 2.45 | 3.34 | 3.26 |
| Potomac Electric Power | 46 | 2.43 | 2.11 | 2.06 |
| Texas Utilities* | 47 | 2.25 | 4.55 | 4.45 |
| KPL Gas Service | 48 | 1.65 | 2.46 | 2.42 |
| Duquesne Light | 49 | 1.12 | 1.81 | 1.79 |
| Madison Gas & Electric | 50 | 1.05 | 2.90 | 2.87 |
| Commonwealth Edison | 51 | 0.85 | 4.73 | 4.69 |
| Florida Progress* (FPC) | 52 | 0.81 | 3.74 | 3.71 |
| Orange & Rockland Utilities | 53 | 0.69 | 2.93 | 2.91 |
| Allegheny Power System* | 54 | 0.50 | 4.05 | 4.03 |
| United Illuminating | 55 | 0.34 | 5.99 | 5.97 |
| American Electric Power* | 56 | -0.76 | 2.60 | 2.62 |
| Union Electric | 57 | -1.69 | 2.91 | 2.96 |
| Houston Industries* | 58 | -1.84 | 3.74 | 3.81 |
| Northern States Power | 59 | -2.59 | 3.01 | 3.09 |
| Utilicorp United | 60 | -2.79 | 1.74 | 1.79 |
| Ohio Edison | 61 | -2.83 | 2.40 | 2.47 |
| Wisconsin Power & Light | 62 | -3.04 | 4.15 | 4.28 |
| Carolina Power & Light | 63 | -3.28 | 3.83 | 3.96 |
| Gulf States Utilities | 64 | -3.51 | 1.65 | 1.71 |
| Northern Indiana Public Service | 65 | -3.64 | 0.53 | 0.55 |
| Central Illinois Public Service | 66 | -4.08 | 1.88 | 1.96 |
| San Diego Gas & Electric | 67 | -4.09 | 3.28 | 3.42 |
| New England Electric* | 68 | -4.69 | 3.05 | 3.20 |
| Midwest Energy* | 69 | -4.97 | 1.53 | 1.61 |
| Illinois Power | 70 | -5.78 | 3.75 | 3.98 |
| Iowa Resources* | 71 | -6.60 | 1.84 | 1.97 |
| Centerior Energy* | 72 | -7.24 | 2.82 | 3.04 |
| Commonwealth Energy System* | 73 | -8.44 | 4.12 | 4.50 |
| Otter Tail Power | 74 | -10.08 | 3.21 | 3.57 |
| Hawaiian Electric* | 75 | -14.40 | 2.20 | 2.57 |
| DPL* | 76 | -14.75 | 2.60 | 3.05 |
| Minnesota Power | 77 | -15.52 | 2.34 | 2.77 |
| Boston Edison | 78 | -16.54 | 2.27 | 2.72 |
| Delmarva Power & Light | 79 | -17.53 | 1.60 | 1.94 |
| Idaho Power | 80 | -18.50 | 1.63 | 2.00 |
| Long Island Lighting | 81 | -18.78 | 1.73 | 2.13 |
| Cilcorp* | 82 | -19.23 | 2.52 | 3.12 |
| Southwestern Public Service | 83 | -20.73 | 2.18 | 2.75 |
| Middle South Utilities* | 84 | -21.62 | 1.74 | 2.22 |
| IPALCO Enterprises* | 85 | -27.22 | 2.36 | 3.27 |
| Cincinnati Gas & Electric | 86 | -28.40 | 2.42 | 3.38 |
| Entech | 87 | -30.96 | 2.52 | 3.65 |
| Public Service of New Mexico | 88 | -39.21 | 2.00 | 3.29 |
| Southern Company* | 89 | -39.43 | 1.92 | 3.17 |
| Pacific Gas & Electric | 90 | -41.15 | 1.53 | 7 60 |
| Iowa Southern* | 91 | -44.32 | 1.52 | 2.73 |
| Interstate Power | 92 | -59.02 | 0.84 | 2.05 |
| El Paso Electric | 93 | -59.05 | 0.95 | 2.32 |
| Public Service of New Hampshire | 94 | -119.88 | -14.16 | -6.44 |
| Central Vermont Public Service | 95 | -171.51 | -2.56 | 3.58 |
| New York State Electric & Gas | 96 | -189.64 | -3.46 | 3.86 |
| Niagara Mohawk Power | 97 | -276.38 | -4.78 | 2.71 |
| Rochester Gas & Electric | 98 | -278.68 | -5.95 | 3.33 |
| Central Hudson Gas & Electric | 99 | -280.85 | -8.12 | 4.49 |
| Centel* | 100 | NA | NA | NA |

## SALES DATA

| | | 1987 Total Sales (KWH) | | 1987 Sales (KWH) By Type of Customer (% of Sales) | | | | Average Annual Residential Use | | Ratio of Long-Term Debt to Net Plant | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Company | Rank | % Increase | Average Annual Growth 1982 - 1986 | Resid. | Comm. | Indus. | Other | 1987 | 1986 | 1987 | 1986 |
| Utilicorp United | 1 | 38.59 | 3.76 | 39.40 | 26.03 | 17.82 | 16.76 | 7,499 | 8,861 | 41.99 | 45.72 |
| Minnesota Power | 2 | 18.63 | 1.15 | 8.97 | 3.75 | 63.93 | 18.34 | 8,004 | 8,264 | 54.19 | 52.17 |
| Midwest Energy* | 3 | 18.39 | -0.55 | 30.83 | 24.04 | 24.49 | 20.65 | 7,374 | 7,089 | 43.25 | 43.87 |
| Green Mountain Power | 4 | 18.37 | 5.29 | 25.95 | 24.85 | 20.93 | 28.26 | 8,802 | 8,872 | 38.99 | 41.53 |
| Empire District Electric | 5 | 17.22 | 4.00 | 27.56 | 19.86 | 17.76 | 34.83 | 10,071 | 9,758 | 33.29 | 36.12 |
| Allegheny Power System* | 6 | 15.47 | -0.51 | 21.61 | 12.55 | 32.72 | 33.12 | 9,560 | 9,285 | 42.43 | 42.96 |
| El Paso Electric | 7 | 13.10 | 4.60 | 23.23 | 25.91 | 12.51 | 38.35 | 6,132 | 6,012 | 63.51 | 59.94 |
| Kentucky Utilities | 8 | 11.28 | 2.51 | 29.66 | 37.22 | 0.00 | 33.12 | 11,517 | 11,120 | 35.66 | 35.39 |
| Nevada Power | 9 | 10.16 | 3.32 | 41.63 | 3.98 | 48.05 | 6.33 | NA | 12,933 | 50.73 | 48.51 |
| DPL* | 10 | 9.08 | 3.14 | 31.68 | 19.85 | 27.91 | 20.56 | 10,232 | 9,994 | 57.67 | 63.35 |
| Central Vermont Public Service | 11 | 9.03 | 3.50 | 30.29 | 26.00 | 13.15 | 30.57 | 8,049 | 8,035 | 51.52 | 56.73 |
| Pacific Gas & Electric | 12 | 7.63 | 0.46 | 32.95 | 33.99 | 24.13 | 8.93 | 6,489 | 6,343 | 53.28 | 50.53 |
| Atlantic Energy* | 13 | 7.56 | 3.32 | 43.35 | 36.96 | 18.87 | 0.83 | 8,281 | 7,982 | 40.29 | 42.96 |
| Sierra Pacific Power | 14 | 7.51 | 0.78 | 30.90 | 39.25 | 26.25 | 3.59 | 7,260 | 7,186 | 78.37 | 79.05 |
| Wisconsin Public Service | 15 | 7.44 | 2.83 | 24.32 | 23.69 | 31.07 | 20.92 | 7,294 | 7,340 | 38.82 | 35.95 |
| New York State Electric & Gas | 16 | 7.29 | 8.61 | 29.78 | 17.50 | 18.32 | 34.40 | 7,569 | 7,538 | 62.15 | 53.51 |
| Duke Power | 17 | 7.00 | 3.56 | 25.61 | 20.12 | 38.57 | 15.71 | 12,830 | 12,413 | 39.61 | 41.46 |
| Iowa Southern* | 18 | 7.00 | 3.27 | 36.32 | 17.25 | 38.16 | 8.28 | 8,241 | 8,007 | 37.75 | 37.47 |
| Northern States Power | 19 | 6.80 | 2.13 | 26.49 | 14.78 | 44.85 | 13.88 | 7,603 | 7,540 | 32.32 | 35.33 |
| San Diego Gas & Electric | 20 | 6.58 | 2.27 | 37.13 | 35.88 | 21.82 | 5.16 | 5,341 | 5,256 | 41.30 | 41.68 |
| Pinnacle West Capital* | 21 | 6.54 | 1.41 | 34.95 | 36.94 | 17.97 | 10.14 | 10,684 | 10,176 | 44.81 | 39.32 |
| Iowa-Illinois Gas & Electric | 22 | 6.47 | 1.40 | 26.62 | 27.22 | 43.32 | 2.84 | 6,861 | 6,454 | 40.19 | 33.78 |
| Duquesne Light | 23 | 6.45 | 1.16 | 22.76 | 36.38 | 21.67 | 19.19 | 6,019 | 5,821 | 54.59 | 46.26 |
| Southern Company* | 24 | 6.43 | 5.50 | 22.49 | 18.90 | 31.64 | 26.98 | 11,145 | 10,514 | 45.34 | 45.29 |
| Baltimore Gas & Electric | 25 | 6.31 | 4.56 | 37.75 | 15.74 | 46.51 | 0.00 | 9,837 | 9,255 | 41.16 | 41.26 |
| Wisconsin Energy* | 26 | 6.24 | 1.94 | 29.15 | 26.39 | 33.13 | 11.33 | 7,603 | 7,461 | 44.38 | 53.12 |
| Cincinnati Gas & Electric | 27 | 6.19 | 2.72 | 34.93 | 25.19 | 29.78 | 10.11 | 10,699 | 10,321 | 46.88 | 49.16 |
| Northern Indiana Public Service | 28 | 5.94 | -1.38 | 19.58 | 4.28 | 73.75 | 2.38 | 7,083 | 6,708 | 43.59 | 48.25 |
| Pennsylvania Power & Light | 29 | 5.85 | 7.29 | 28.43 | 23.15 | 26.20 | 22.21 | 9,565 | 9,344 | 38.82 | 42.77 |
| Ohio Edison | 30 | 5.48 | 3.45 | 24.57 | 19.46 | 30.52 | 25.45 | 8,140 | 7,924 | 89.57 | 82.04 |
| Dominion Resources* | 31 | 5.47 | 4.84 | 35.53 | 27.71 | 16.24 | 20.52 | 12,667 | 12,277 | 48.37 | 46.35 |
| Kansas City Power & Light | 32 | 5.41 | 3.10 | 31.04 | 43.58 | 23.56 | 1.82 | 8,917 | 8,563 | 43.25 | 45.30 |
| Philadelphia Electric | 33 | 5.39 | 2.12 | 30.91 | 14.21 | 51.69 | 3.19 | 7,427 | 7,097 | 49.91 | 46.99 |
| Central Maine Power | 34 | 5.24 | 4.71 | 34.17 | 23.57 | 40.50 | 1.76 | 7,196 | 7,145 | 50.36 | 50.27 |
| Pacificorp | 35 | 5.15 | 0.07 | 25.00 | 21.37 | 33.48 | 20.15 | 11,444 | 11,448 | 33.51 | 35.56 |
| Carolina Power & Light | 36 | 4.96 | 2.68 | 26.50 | 18.56 | 31.63 | 23.30 | 12,557 | 12,170 | 39.18 | 39.66 |
| Consolidated Edison | 37 | 4.78 | 0.27 | 27.24 | 66.75 | 4.43 | 1.58 | 3,709 | 3,511 | 37.60 | 37.43 |
| Kansas Gas & Electric | 38 | 4.63 | 0.93 | 26.19 | 21.22 | 36.11 | 16.48 | 9,314 | 9,202 | 53.17 | 54.31 |
| SCANA Corporation* (SCE&G) | 39 | 4.48 | 3.87 | 32.44 | 26.36 | 32.18 | 9.02 | 12,988 | 12,821 | 34.00 | 29.63 |
| Long Island Lighting | 40 | 4.42 | 2.40 | 43.20 | 0.00 | 52.37 | 4.43 | 7,569 | 7,260 | 44.59 | 48.49 |
| Rochester Gas & Electric | 41 | 4.40 | 1.04 | 28.16 | 24.77 | 25.47 | 21.60 | 6,940 | 6,759 | 57.32 | 44.72 |
| Potomac Electric Power | 42 | 4.36 | 4.26 | 26.25 | 41.96 | 21.95 | 9.84 | 10,526 | 10,022 | 41.26 | 40.47 |
| United Illuminating | 43 | 4.32 | 1.96 | 34.74 | 39.93 | 24.12 | 1.21 | 6,562 | 6,356 | 49.76 | 45.85 |
| Public Service Enterprise Group* | 44 | 4.30 | 2.85 | 26.78 | 43.16 | 28.72 | 1.34 | 5,939 | 5,650 | 36.64 | 37.87 |
| FPL Group* (FP&L) | 45 | 4.27 | 3.06 | 50.06 | 39.53 | 7.00 | 3.41 | 11,236 | 11,243 | 36.79 | 38.65 |
| Cilcorp* | 46 | 4.11 | 1.15 | 31.65 | 23.57 | 43.30 | 1.47 | 8,941 | 8,593 | 36.36 | 37.89 |
| Northeast Utilities* | 47 | 4.11 | 2.95 | 37.71 | 34.83 | 23.28 | 4.19 | 8,061 | 7,746 | 48.38 | 47.09 |
| Savannah Electric & Power | 48 | 4.06 | 1.66 | 42.25 | 30.60 | 23.31 | 3.84 | 11,481 | 11,514 | 40.58 | 46.53 |
| Otter Tail Power | 49 | 4.03 | -3.24 | 27.78 | 15.24 | 36.26 | 20.72 | 9,280 | 9,966 | 30.17 | 31.31 |
| Florida Progress* (FPC) | 50 | 4.03 | 3.32 | 42.81 | 24.96 | 13.90 | 18.33 | 11,356 | 11,255 | 31.98 | 37.16 |
| General Public Utilities* | 51 | 4.02 | 2.18 | 34.41 | 28.41 | 33.57 | 3.62 | 7,938 | 7,682 | 35.59 | 38.68 |
| Centerior Energy* | 52 | 4.01 | 1.66 | 25.28 | 24.11 | 45.50 | 5.12 | 7,448 | 7,346 | 52.93 | 115.91 |
| Wisconsin Power & Light | 53 | 3.94 | 5.01 | 25.97 | 15.55 | 30.56 | 27.92 | 8,236 | 8,105 | 39.31 | 41.21 |
| Delmarva Power & Light | 54 | 3.90 | 5.40 | 28.56 | 26.52 | 27.30 | 17.62 | 9,152 | 8,605 | 48.76 | 50.82 |
| Niagara Mohawk Power | 55 | 3.89 | 1.05 | 27.06 | 30.04 | 30.61 | 12.30 | 7,382 | 7,249 | 51.61 | 43.30 |
| Detroit Edison | 56 | 3.82 | 3.78 | 28.19 | 19.94 | 46.15 | 5.72 | 6,635 | 6,350 | 48.47 | 40.47 |
| Public Service of Indiana | 57 | 3.68 | 0.88 | 28.41 | 23.30 | 33.42 | 14.87 | 10,966 | 10,777 | 40.27 | 62.72 |
| Hawaiian Electric* | 58 | 3.68 | 2.17 | 28.03 | 25.67 | 45.51 | 0.79 | 7,114 | 6,911 | 34.92 | 36.87 |
| Commonwealth Edison | 59 | 3.64 | 1.99 | 28.18 | 29.82 | 30.67 | 11.33 | 6,756 | 6,525 | 35.70 | 38.08 |
| TECO Energy* | 60 | 3.54 | 2.50 | 40.31 | 30.17 | 22.22 | 7.29 | 12,646 | 12,590 | 34.77 | 35.38 |
| Houston Industries* | 61 | 3.53 | -0.89 | 26.29 | 20.01 | 49.08 | 4.61 | 12,812 | 12,675 | 34.42 | 37.87 |
| CMS Energy* | 62 | 3.43 | 2.56 | 31.54 | 26.62 | 37.99 | 3.85 | 7,029 | 6,852 | 60.20 | 89.69 |
| Texas Utilities* | 63 | 3.35 | 4.93 | 33.07 | 28.70 | 27.54 | 10.69 | 13,147 | 12,749 | 41.28 | 38.79 |
| Madison Gas & Electric | 64 | 3.08 | 0.84 | 28.63 | 55.48 | 5.44 | 10.45 | 6,400 | 6,222 | 44.18 | 48.66 |
| Southern Indiana Gas & Electric | 65 | 3.01 | 4.77 | 24.48 | 19.93 | 38.30 | 17.29 | 11,518 | 11,341 | 38.57 | 27.71 |
| Public Service of New Mexico | 66 | 2.93 | 0.74 | 20.91 | 28.92 | 11.24 | 38.94 | 6,015 | 5,822 | 47.07 | 47.37 |
| Louisville Gas & Electric | 67 | 2.72 | 2.85 | 32.90 | 27.03 | 29.12 | 10.95 | 10,282 | 9,898 | 37.42 | 39.84 |
| Orange & Rockland Utilities | 68 | 2.68 | 2.90 | 33.71 | 22.64 | 31.11 | 12.54 | 6,703 | 6,385 | 42.71 | 41.71 |
| Union Electric | 69 | 2.66 | 3.45 | 33.04 | 33.03 | 28.33 | 5.60 | 10,390 | 10,227 | 45.51 | 46.91 |
| Tucson Electric Power | 70 | 2.66 | 10.17 | 29.54 | 18.31 | 35.96 | 16.20 | 8,404 | 7,965 | 63.55 | 60.10 |
| IPALCO Enterprises* | 71 | 2.65 | 3.25 | 32.20 | 22.37 | 44.62 | 0.81 | 10,525 | 10,347 | 39.45 | 40.05 |
| Oklahoma Gas & Electric | 72 | 2.47 | -2.41 | 32.79 | 22.60 | 28.30 | 16.31 | 10,857 | 10,591 | 36.31 | 38.04 |
| Public Service of Colorado | 73 | 2.39 | 3.23 | 28.60 | 47.43 | 19.02 | 4.96 | 6,258 | 6,152 | 38.21 | 34.64 |
| Interstate Power | 74 | 2.38 | -0.90 | 23.17 | 18.77 | 51.65 | 6.41 | 7,447 | 7,229 | 44.68 | 44.37 |
| Utah Power & Light | 75 | 2.10 | 0.51 | 19.82 | 17.77 | 41.79 | 20.63 | 7,730 | 7,907 | 49.03 | 44.52 |
| Southern California Edison | 76 | 2.09 | 1.64 | 30.15 | 33.18 | 32.76 | 3.91 | 6,117 | 5,999 | 39.89 | 42.06 |
| IE Industries* | 77 | 1.70 | 1.19 | 32.29 | 25.87 | 33.62 | 8.21 | 8,169 | 8,143 | 29.01 | 35.77 |
| Eastern Utilities Associates* | 78 | 1.65 | 3.06 | 27.98 | 27.92 | 18.18 | 25.92 | 5,996 | 5,792 | 52.49 | 51.98 |
| KPL Gas Service | 79 | 1.35 | 0.32 | 23.21 | 28.39 | 19.58 | 28.83 | 8,320 | 8,108 | 32.43 | 32.31 |
| Commonwealth Energy System* | 80 | 1.21 | 2.34 | 25.55 | 26.51 | 7.59 | 40.34 | 5,915 | 5,948 | 38.73 | 35.30 |
| New England Electric* | 81 | 0.85 | 3.89 | 36.66 | 33.97 | 24.64 | 4.73 | 6,776 | 6,500 | 46.95 | 51.99 |
| Illinois Power | 82 | 0.66 | 1.80 | 27.65 | 18.66 | 47.75 | 5.93 | 8,748 | 8,694 | 43.44 | 43.61 |
| Boston Edison | 83 | 0.49 | 0.61 | 25.59 | 54.18 | 14.87 | 5.36 | 5,903 | 5,735 | 39.04 | 38.60 |
| Washington Water Power | 84 | 0.43 | -0.71 | 32.15 | 22.44 | 12.88 | 32.53 | 13,062 | 13,674 | 56.04 | 57.21 |
| Central Louisiana Electric | 85 | -0.14 | 1.07 | 39.50 | 18.39 | 34.85 | 7.26 | 11,873 | 11,964 | 40.72 | 42.17 |
| Central & South West* | 86 | -0.17 | -0.28 | 29.58 | 24.77 | 31.00 | 14.65 | 10,464 | 10,328 | 34.69 | 34.95 |
| Middle South Utilities* | 87 | -0.30 | 2.47 | 29.59 | 20.29 | 35.77 | 14.35 | 11,693 | 11,789 | 52.89 | 55.37 |
| Public Service of New Hampshire | 88 | -1.07 | 3.16 | 32.41 | 14.80 | 31.99 | 20.80 | 7,181 | 7,119 | 56.77 | 55.83 |
| Central Hudson Gas & Electric | 89 | -1.37 | -0.19 | 28.53 | 25.77 | 34.18 | 11.52 | 6,738 | 6,491 | 84.45 | 114.53 |
| Iowa Resources* | 90 | -1.54 | 3.73 | 36.38 | 25.96 | 33.38 | 4.28 | 8,560 | 8,463 | 40.97 | 44.54 |
| Gulf States Utilities | 91 | -1.88 | -1.27 | 23.32 | 18.45 | 44.37 | 13.86 | 12,818 | 12,731 | 52.09 | 51.89 |
| Centel* | 92 | -2.26 | 0.46 | 29.06 | 30.40 | 20.46 | 20.07 | 6,684 | 6,492 | 0.00 | 0.00 |
| Puget Sound Power & Light | 93 | -2.77 | 0.04 | 47.50 | 30.45 | 18.91 | 3.14 | 12,758 | 13,396 | 57.53 | 58.60 |
| Central Illinois Public Service | 94 | -2.90 | -2.52 | 32.48 | 13.20 | 46.66 | 7.66 | 9,001 | 8,806 | 40.60 | 40.23 |
| Southwestern Public Service | 95 | -3.97 | 6.00 | 14.04 | 15.37 | 38.43 | 32.17 | 7,757 | 7,672 | 39.83 | 39.52 |
| Portland General* | 96 | -6.44 | 3.59 | 33.76 | 28.40 | 19.32 | 18.52 | 11,751 | 11,987 | 53.73 | 57.88 |
| American Electric Power* | 97 | -7.79 | 1.74 | 24.94 | 17.15 | 37.34 | 20.57 | 10,526 | 10,049 | 50.47 | 49.95 |
| TNP Enterprises* (Tex-NM Power) | 98 | -8.38 | 4.27 | 30.15 | 21.26 | 46.30 | 2.30 | 10,668 | 10,465 | 35.47 | 36.06 |
| Entech | 99 | -10.05 | 5.15 | 19.82 | 20.59 | 30.54 | 29.04 | 8,377 | 8,566 | 48.07 | 49.71 |
| Idaho Power | 100 | -12.50 | -0.69 | 26.45 | 15.07 | 30.12 | 28.36 | 13,785 | 14,541 | 40.13 | 41.05 |

### TABLE I
### THE TOP 10 IN KWH SALES

| Rank '87 | Rank '86 | Company | KWH Sales (millions) | '87% Change |
|---|---|---|---|---|
| 1 | 1 | Southern Company | 131,343 | 6.43 |
| 2 | 2 | American Electric Power | 98,206 | -7.79 |
| 3 | 3 | Texas Utilities | 77,773 | 3.35 |
| 4 | 4 | Commonwealth Edison | 67,490 | 3.64 |
| 5 | 6 | Pacific Gas & Electric | 66,558 | 7.63 |
| 6 | 5 | Southern California Edison | 65,538 | 2.09 |
| 7 | 7 | Duke Power | 64,751 | 7.00 |
| 8 | 8 | Middle South Utilities | 57,631 | -0.30 |
| 9 | 9 | FPL Group | 58,592 | 4.27 |
| 10 | 10 | Houston Industries | 55,911 | 3.53 |

Southern California Edison, fifth in 1986, posted just a 2.1-percent increase and slipped one position. SoCalEd was replaced by Pacific Gas & Electric, sixth in 1986, which enjoyed a healthy 7.6-percent increase in kWh sales. All others among the 10 largest kWh sellers held the same positions as a year earlier.

The Southern Company, perennial sales leader, enjoyed a strong sales year in 1987, increasing its kWh sales by 6.4 percent. Usual runner-up, American Electric Power, suffered a 7.8-percent decline in kWh sales despite increased sales to residential, commercial and industrial customers. A large drop in sales to "other" customers contributed to AEP's ranking of 97th among the Top 100 Electric Utilities.

Average annual residential use also increased in 1987, hitting an all-time high of 8928 kWh, 1.2 percent above the previous record, which was established in 1984, when average residential use hit 8823 kWh. In 1986, according to revised figures submitted by the Top 100 Electric Utilities, average residential use was 8784. A year ago, the Top 100 utilities submitted figures that showed average residential use as 8634 kWh.

Interestingly, 1987 average residential kWh use was just 2.6 percent higher than a decade earlier, in 1978, reflecting an era of essentially flat industry growth.

As in the past, the companies posting the largest average residential kWh-use gains tended to be in the low-cost-of-electricity Pacific Northwest and in hot, humid areas of the South and Southwest. The leaders were: 1. Idaho Power, 13,785 kWh; 2. Nevada Power, 13,468 kWh; 3. Texas Utilities, 13,147 kWh; 4. Washington Water Power, 13,062 kWh; 5. SCANA Corp., 12,988 kWh; 6. Duke Power, 12,830 kWh; 7. Gulf States Utilities, 12,818 kWh; 8. Houston Lighting & Power, 12,812; 9. Puget Sound Power & Light, 12,750 kWh; and 10. Dominion Resources, 12,667 kWh.

At the opposite end of the spectrum were companies located in the high cost-of-service areas of New England and the metropolitan New York-Newark region. Companies posting the lowest average residential use included: 96. Eastern Utilities Associates, 5,939 kWh; 97. Public Service Enterprises Group, 5,915 kWh; 98. Commonwealth Energy System, 5,903 kWh; 99. Boston Edison, 5341 kWh; and 100. Consolidated Edison, 3,709 kWh.

### Slight revenue gain

Total revenues for the Top 100 Electric Utilities increased slightly in 1987, to $150 billion, a gain of just 0.5 percent from 1986's total revenues of $149.2 billion. While the 1987 performance was a bit upward, total revenues still were $100 million below those posted in 1985. Total revenues included funds from all sources for each of the companies reporting, including

## TABLE II
## THE TOP 10
## TOTAL REVENUES

| Rank '87 | Rank '86 | Company | '87 $ Revenues (millions) | '87% Change |
|---|---|---|---|---|
| 1 | 1 | Pacific Gas & Electric | 7,186 | -8.07 |
| 2 | 2 | Southern Company* | 7,010 | 2.39 |
| 3 | 3 | Commonwealth Edison | 5,674 | 3.56 |
| 4 | 4 | Southern California Edison | 5,494 | 3.41 |
| 5 | 5 | Consolidated Edison | 5,094 | -1.99 |
| 6 | 6 | American Electric Power* | 4,788 | -3.25 |
| [illegible] | 8 | FPL Group* | 4,439 | 8.50 |
| [illegible] | [illegible] | [illegible] Service [illegible] | 4,211 | -6.39 |
| 9 | [illegible] | [illegible]ies* | 4,083 | 3.84 |
| 10 | 12 | [illegible] Power | 3,706 | 8.96 |

those of both regulated and non-regulated subsidiaries of utility holding companies.

Several factors led to the lack of revenue growth. Certainly, fewer rate increases were granted in 1987 and they tended to be smaller in size. Also, a number of general rate reductions were ordered by state commissions and some rate redesigns were initiated. Reduced fuel-cost pass-throughs also contibuted to lower revenues. Rate revisions to reflect the reduction in federal corporate income taxes resulting from the Tax Reform Act of 1986 also were a major factor in reductions in revenues.

Overall, only slightly more than half the Top 100 Electric Utilities—just 52 companies—reported revenue increases for 1987. Still, this was a bit better than for 1986, when only 41 companies reported revenue gains. Median revenue growth was 0.5 percent for 1987, the same as the gain in total revenues. A year ago, however, total revenues were reported to have fallen by 1.3 percent and the median revenue change was a -0.6 percent.

Holding companies reported total revenues of $52.2-billion, while operating utilities only reported revenues of $97.8-billion. In 1986, holding companies reported total revenues of $52.0-billion while operating utilities only enjoyed revenues of $97.3-billion. Total revenues from utility operations for utility-only and holding company-owned utility subsidiaries totalled $148.0-billion in 1987, up just 0.4 percent from 1986.

The relative contribution of non-utility operations was clear in this year's survey. Non-utility operations represented just 1.3 percent of total Top 100 revenues.

The largest revenue gain, 17.6 percent, was recorded by Central Maine Public Service, largely on the strength of higher rates granted in 1986 and improved kWh sales. Central Maine posted revenues of $598.2-million. San Diego Gas & Electric ranked second in revenue growth in 1987, up 16.5 percent, on the strength of both higher rates and better kWh sales. The third-ranked revenue gainer was Allegheny Power Systems, which enjoyed substantially greater kWh sales that more than overcame the effect of mandated rate reductions during the year. APS increased its revenues by 16.3 percent in 1987.

Utilities suffering the greatest reductions in revenues included Iowa Southern Inc., ranked 100th, which suffered a mandated $33-million refund of electric revenues and lower rates, plus reduced gas sales as a result of temperate winter weather. Also, Iowa Illinois Gas & Electric, 99th, which reported revenues that fell 11.1 percent because of markedly reduced gas sales and changes in billing and accounting procedures. Northern Indiana Public Ser-

## FINANCIAL STATISTICS

| Company | Net Income Rank | Net Income % Gain | Revenue Rank | Revenue % Gain | Sales (KWH) Rank | Sales (KWH) % Gain | Int. Cov. Ratio 1987 | Int. Cov. Ratio 1986 | Earnings Per Share $ 1987 | Price/Share 1987 (Dollars) High | Price/Share 1987 (Dollars) Low | % Change Long-Term Debt '86-'87 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Public Service of Colorado | 1 | 2301.79 | 53 | -0.03 | 73 | 2.39 | 1.80 | 0.06 | 3.05 | 22.875 | 17.250 | 8.83 |
| Kansas Gas & Electric | 2 | 1575.09 | 30 | 3.18 | 38 | 4.63 | 0.94 | 0.06 | 2.34 | 25.625 | 16.000 | -7.02 |
| Portland General* | 3 | 614.03 | 49 | 0.52 | 96 | -6.44 | 1.26 | 0.20 | 2.45 | 31.500 | 20.625 | -9.27 |
| Washington Water Power | 4 | 246.18 | 38 | 2.22 | 84 | 0.43 | 1.00 | 0.28 | 2.31 | 30.250 | 22.250 | -2.00 |
| CMS Energy* | 5 | 182.54 | 96 | -9.91 | 62 | 3.43 | 0.49 | 0.16 | 2.15 | 20.000 | 10.750 | -2.59 |
| Philadelphia Electric | 6 | 141.54 | 46 | 1.26 | 33 | 5.39 | 1.14 | 0.50 | 2.33 | 26.000 | 16.750 | 13.62 |
| Utah Power & Light | 7 | 66.10 | 55 | -0.21 | 75 | 2.10 | 1.09 | 0.76 | 2.39 | 30.875 | 20.750 | 10.10 |
| Public Service Enterprise Group* | 8 | 37.52 | 91 | -6.39 | 44 | 4.30 | 1.60 | 1.20 | 2.55 | 30.580 | 20.000 | -0.73 |
| Atlantic Energy* | 9 | 34.25 | 6 | 11.19 | 13 | 7.56 | 1.54 | 1.19 | 4.03 | 41.375 | 28.750 | -1.15 |
| Eastern Utilities Associates* | 10 | 34.03 | 17 | 6.93 | 78 | 1.65 | 0.60 | 0.77 | 3.46 | 40.500 | 24.000 | 13.08 |
| TNP Enterprises* (Tex-NM Power) | 11 | 29.04 | 44 | 1.28 | 98 | -8.38 | 1.61 | 1.12 | 2.41 | 23.750 | 17.250 | 4.41 |
| Puget Sound Power & Light | 12 | 26.22 | 39 | 2.04 | 93 | -2.77 | 1.26 | 1.20 | 2.13 | 22.500 | 17.750 | -2.46 |
| Detroit Edison | 13 | 26.02 | 57 | -0.44 | 56 | 3.82 | 1.07 | 0.85 | 3.25 | 19.000 | 12.500 | 28.36 |
| Northeast Utilities* | 14 | 25.95 | 36 | 2.40 | 47 | 4.11 | 1.36 | 1.08 | 2.11 | 28.000 | 18.000 | 5.63 |
| General Public Utilities* | 15 | 22.83 | 84 | -4.08 | 51 | 4.02 | 1.68 | 1.31 | 4.12 | 29.750 | 21.750 | -3.35 |
| Pinnacle West Capital* | 16 | 21.50 | 23 | 5.08 | 21 | 6.54 | 1.82 | 1.25 | 3.40 | 32.375 | 26.625 | 18.33 |
| Nevada Power | 17 | 20.77 | 67 | -2.24 | 9 | 10.16 | 1.76 | 1.35 | 2.01 | 22.000 | 16.375 | 8.49 |
| Green Mountain Power | 18 | 19.95 | 4 | 14.76 | 4 | 18.37 | 2.17 | 1.70 | 2.63 | 29.250 | 20.500 | -1.78 |
| IE Industries* | 19 | 19.41 | 81 | -3.84 | 77 | 1.70 | 1.54 | 1.24 | 2.48 | 27.625 | 20.875 | -16.86 |
| Tucson Electric Power | 20 | 16.51 | 7 | 10.92 | 70 | 2.66 | 2.95 | 4.51 | 4.95 | 64.250 | 49.250 | 19.55 |
| Kentucky Utilities | 21 | 14.73 | 51 | 0.46 | 8 | 11.28 | 2.01 | 1.74 | 1.72 | 22.250 | 15.000 | -0.02 |
| TECO Energy* | 22 | 13.39 | 15 | 7.59 | 60 | 3.54 | 2.39 | 1.95 | 1.95 | 26.375 | 20.250 | -0.04 |
| Dominion Resources* | 23 | 11.76 | 22 | 5.60 | 31 | 5.47 | 1.35 | 1.26 | 4.54 | 49.875 | 36.625 | 8.56 |
| Baltimore Gas & Electric | 24 | 10.47 | 62 | -1.35 | 25 | 6.31 | 2.31 | 2.06 | 3.47 | 37.875 | 19.000 | 3.23 |
| Iowa-Illinois Gas & Electric | 25 | 10.41 | 99 | -11.13 | 22 | 6.47 | 1.94 | 1.63 | 4.38 | 47.000 | 34.500 | 17.49 |
| FPL Group* (FP&L) | 26 | 10.25 | 11 | 8.50 | 45 | 4.27 | 1.48 | 1.41 | 3.10 | 34.875 | 24.375 | -1.67 |
| Central Louisiana Electric | 27 | 9.89 | 35 | 2.45 | 85 | -0.14 | 1.26 | 1.10 | 3.52 | 37.000 | 28.750 | -1.14 |
| Duke Power | 28 | 9.01 | 9 | 8.96 | 17 | 7.00 | 1.93 | 1.67 | 4.40 | 51.750 | 39.375 | -0.45 |
| Texas Utilities* | 29 | 8.47 | 27 | 3.84 | 63 | 3.35 | 1.80 | 1.82 | 4.55 | 36.625 | 25.500 | 20.02 |
| Savannah Electric & Power | 30 | 8.34 | 52 | 0.29 | 48 | 4.06 | 1.28 | 1.11 | 2.05 | 22.000 | 14.625 | -9.40 |
| Pacificorp | 31 | 7.76 | 25 | 4.63 | 35 | 5.15 | 1.25 | 1.06 | 3.60 | 39.000 | 26.750 | -4.03 |
| Kansas City Power & Light | 32 | 7.65 | 20 | 6.01 | 32 | 5.41 | 0.98 | 0.86 | 3.01 | 31.750 | 21.000 | -5.43 |
| Wisconsin Energy* | 33 | 7.48 | 77 | -3.30 | 26 | 6.24 | 2.15 | 2.50 | 2.55 | 28.875 | 21.000 | -5.19 |
| Pennsylvania Power & Light | 34 | 7.35 | 87 | -4.58 | 29 | 5.85 | 0.82 | 0.75 | 3.32 | 41.375 | 28.625 | -8.78 |
| Utilicorp United | 35 | 6.62 | 54 | -0.16 | 1 | 38.59 | 0.83 | 0.94 | 1.74 | 22.350 | 13.360 | 19.16 |
| Sierra Pacific Power | 36 | 6.57 | 80 | -3.53 | 14 | 7.51 | 1.27 | 1.26 | 2.03 | 27.125 | 18.000 | 4.17 |
| Southern Indiana Gas & Electric | 37 | 5.74 | 34 | 2.53 | 65 | 3.01 | 1.75 | 1.44 | 3.42 | 41.250 | 31.000 | 39.27 |
| SCANA Corporation* (SCE&G) | 38 | 5.49 | 45 | 1.26 | 39 | 4.48 | 1.99 | 1.61 | 3.20 | 40.000 | 26.500 | 18.34 |
| Empire District Electric | 39 | 5.33 | 5 | 13.33 | 5 | 17.22 | 2.16 | 1.96 | 2.95 | 34.000 | 27.375 | 0.00 |
| Commonwealth Edison | 40 | 4.79 | 28 | 3.56 | 59 | 3.64 | 1.44 | 1.34 | 4.73 | 38.000 | 25.250 | -1.29 |
| Central & South West* | 41 | 4.59 | 88 | -4.64 | 86 | -0.17 | 2.05 | 2.12 | 3.92 | 40.500 | 27.000 | 5.07 |
| Louisville Gas & Electric | 42 | 4.54 | 86 | -4.45 | 67 | 2.72 | 1.46 | 1.35 | 3.34 | 40.750 | 30.125 | -0.95 |
| Wisconsin Public Service | 43 | 3.97 | 65 | -1.99 | 15 | 7.44 | 2.37 | 2.24 | 2.11 | 26.875 | 18.875 | 11.48 |
| Florida Progress* (FPC) | 44 | 3.64 | 31 | 3.09 | 50 | 4.03 | 1.90 | 1.57 | 3.74 | 43.875 | 29.375 | -12.89 |
| Southern California Edison | 45 | 3.45 | 29 | 3.41 | 76 | 2.09 | 1.78 | 1.57 | 3.39 | 37.000 | 27.625 | -2.74 |
| Central Maine Power | 46 | 2.73 | 1 | 17.56 | 34 | 5.24 | 1.04 | 0.92 | 1.79 | 20.500 | 12.500 | 6.13 |
| Oklahoma Gas & Electric | 47 | 2.56 | 70 | -2.42 | 72 | 2.47 | 1.65 | 1.77 | 2.85 | 36.625 | 28.000 | -4.45 |
| Potomac Electric Power | 48 | 2.55 | 72 | -2.80 | 42 | 4.36 | 2.31 | 2.03 | 2.11 | 27.375 | 18.000 | 7.41 |
| Houston Industries* | 49 | 2.36 | 33 | 2.61 | 61 | 3.53 | 2.11 | 1.93 | 3.74 | 39.380 | 26.500 | -2.42 |
| Madison Gas & Electric | 50 | 1.81 | 82 | -3.90 | 64 | 3.08 | 1.52 | 1.78 | 2.90 | 37.000 | 29.750 | -5.34 |
| Allegheny Power System* | 51 | 1.59 | 3 | 16.26 | 6 | 15.47 | 1.54 | 1.54 | 4.05 | 49.000 | 31.375 | 1.27 |
| KPL Gas Service | 52 | 1.48 | 71 | -2.70 | 79 | 1.35 | 1.66 | 1.60 | 2.46 | 30.750 | 20.250 | 3.00 |
| Ohio Edison | 53 | 1.34 | 26 | 4.60 | 30 | 5.48 | 1.00 | 0.90 | 2.40 | 23.250 | 16.500 | -4.46 |
| Consolidated Edison | 54 | 0.78 | 64 | -1.99 | 37 | 4.78 | 2.43 | 2.56 | 4.42 | 52.000 | 37.500 | 3.54 |
| United Illuminating | 55 | 0.78 | 21 | 5.63 | 43 | 4.32 | 0.85 | 0.91 | 5.99 | 34.000 | 21.250 | 17.06 |
| Orange & Rockland Utilities | 56 | 0.71 | 89 | -5.12 | 68 | 2.68 | 1.32 | 1.49 | 2.93 | 36.250 | 25.000 | 14.33 |
| Duquesne Light | 57 | 0.50 | 60 | -0.92 | 23 | 6.45 | 0.77 | 0.77 | 1.81 | 14.375 | 10.625 | 4.76 |
| Centerior Energy* | 58 | -0.39 | 43 | 1.45 | 52 | 4.01 | 0.90 | 0.97 | 2.82 | 24.875 | 15.000 | -1.96 |
| American Electric Power* | 59 | -0.93 | 75 | -3.25 | 97 | -7.79 | 0.92 | 0.89 | 2.60 | 31.625 | 23.125 | 2.60 |
| Carolina Power & Light | 60 | -1.55 | 41 | 2.01 | 36 | 4.96 | 1.25 | 1.34 | 3.83 | 42.875 | 30.250 | 2.42 |
| Union Electric | 61 | -1.73 | 14 | 7.70 | 69 | 2.66 | 1.30 | 1.22 | 2.91 | 31.625 | 19.875 | -3.25 |
| Illinois Power | 62 | -1.80 | 32 | 3.01 | 82 | 0.66 | 1.24 | 1.29 | 3.75 | 31.500 | 21.250 | 1.46 |
| New England Electric* | 63 | -1.87 | 47 | 1.13 | 81 | 0.85 | 2.13 | 1.97 | 3.05 | 32.875 | 20.000 | -0.71 |
| Gulf States Utilities | 64 | -2.07 | 74 | -3.10 | 91 | -1.88 | 0.58 | 0.70 | 1.65 | 10.000 | 4.750 | -2.53 |
| Northern States Power | 65 | -2.63 | 58 | -0.63 | 19 | 6.80 | 1.97 | 2.04 | 3.01 | 39.750 | 26.250 | -3.37 |
| Wisconsin Power & Light | 66 | -3.01 | 79 | -3.49 | 53 | 3.94 | 1.89 | 1.84 | 4.15 | 54.750 | 42.500 | -3.12 |
| San Diego Gas & Electric | 67 | -4.04 | 2 | 16.52 | 20 | 6.58 | 1.78 | 1.70 | 3.28 | 37.875 | 28.250 | 0.89 |
| Central Illinois Public Service | 68 | -4.37 | 90 | -5.67 | 94 | -2.90 | 1.61 | 1.76 | 1.86 | 30.000 | 19.500 | 0.02 |
| Midwest Energy* | 69 | -4.94 | 94 | -9.24 | 3 | 18.39 | 1.06 | 0.90 | 1.53 | 24.875 | 15.000 | -1.43 |
| Commonwealth Energy System* | 70 | -6.40 | 95 | -9.61 | 80 | 1.21 | 2.50 | 2.47 | 4.12 | 45.750 | 29.250 | 22.70 |
| Iowa Resources* | 71 | -6.49 | 42 | 1.80 | 90 | -1.54 | 1.55 | 1.46 | 1.84 | 25.750 | 17.375 | -8.07 |
| Otter Tail Power | 72 | -10.07 | 73 | -3.03 | 49 | 4.03 | 1.62 | 1.62 | 3.21 | 49.750 | 33.500 | -4.27 |
| Boston Edison | 73 | -12.22 | 18 | 6.85 | 83 | 0.49 | 1.24 | 1.47 | 2.27 | 28.000 | 16.750 | 12.86 |
| Hawaiian Electric* | 74 | -12.26 | 16 | 7.12 | 58 | 3.68 | 1.32 | 1.42 | 2.20 | 34.250 | 22.250 | 0.87 |
| DPL* | 75 | -14.29 | 69 | -2.33 | 10 | 9.08 | 1.37 | 1.36 | 2.60 | 29.250 | 22.125 | -7.52 |
| Minnesota Power | 76 | -15.26 | 13 | 7.76 | 2 | 18.63 | 1.64 | 2.09 | 2.34 | 35.250 | 19.750 | 6.06 |
| Delmarva Power & Light | 77 | -17.73 | 56 | -0.33 | 54 | 3.90 | 1.31 | 1.62 | 1.60 | 23.375 | 16.250 | -3.23 |
| Idaho Power | 78 | -18.65 | 78 | -3.49 | 100 | -12.50 | 0.98 | 1.20 | 1.63 | 30.250 | 19.000 | -3.18 |
| Long Island Lighting | 79 | -18.81 | 24 | 4.80 | 40 | 4.42 | 0.51 | 0.84 | 1.73 | 12.375 | 6.500 | -2.11 |
| Cilcorp* | 80 | -19.20 | 92 | -7.17 | 46 | 4.11 | 1.68 | 1.91 | 2.52 | 43.375 | 29.000 | -4.10 |
| Southwestern Public Service | 81 | -20.65 | 85 | -4.13 | 95 | -3.97 | 1.68 | 1.91 | 2.18 | 36.750 | 25.625 | 0.56 |
| Middle South Utilities* | 82 | -21.53 | 59 | -0.89 | 87 | -0.30 | 0.46 | 0.56 | 1.74 | 16.250 | 7.750 | -0.63 |
| Cincinnati Gas & Electric | 83 | -26.69 | 76 | -3.28 | 27 | 6.19 | 1.09 | 1.37 | 2.42 | 29.750 | 23.125 | 1.36 |
| IPALCO Enterprises* | 84 | -27.21 | 12 | 8.06 | 71 | 2.65 | 1.66 | 1.37 | 2.38 | 28.750 | 19.500 | -1.40 |
| Entech | 85 | -28.90 | 50 | 0.50 | 99 | -10.05 | 1.13 | 1.62 | 2.52 | 41.750 | 29.500 | -1.06 |
| Public Service of New Mexico | 86 | -37.17 | 61 | -1.24 | 66 | 2.93 | 1.14 | 1.60 | 2.00 | 39.250 | 17.375 | -1.19 |
| Southern Company* | 87 | -37.20 | 37 | 2.39 | 24 | 6.43 | 0.68 | 1.12 | 1.92 | 29.000 | 17.875 | 6.02 |
| Pacific Gas & Electric | 88 | -37.54 | 93 | -8.07 | 12 | 7.63 | 0.74 | 1.28 | 1.53 | 27.880 | 15.000 | 9.94 |
| Iowa Southern* | 89 | -44.39 | 100 | -14.95 | 18 | 7.00 | 0.51 | 1.54 | 1.52 | 34.750 | 26.500 | -0.40 |
| Interstate Power | 90 | -58.49 | 97 | -10.62 | 74 | 2.38 | 0.44 | 0.95 | 0.84 | 30.000 | 19.375 | -0.21 |
| El Paso Electric | 91 | -58.79 | 19 | 6.19 | 7 | 13.10 | 0.36 | 0.92 | 0.95 | 21.625 | 13.125 | -7.18 |
| Public Service of New Hampshire | 92 | -120.04 | 10 | 8.69 | 88 | -1.07 | 0.00 | -1.70 | -14.16 | 9.375 | 2.250 | 0.10 |
| Central Vermont Public Service | 93 | -172.49 | 8 | 9.50 | 11 | 9.03 | 0.00 | 21.89 | -2.56 | 31.000 | 20.625 | -6.47 |
| New York State Electric & Gas | 94 | -195.69 | 48 | 0.97 | 16 | 7.29 | 0.00 | 1.25 | -3.46 | 33.250 | 20.175 | 6.58 |
| Niagara Mohawk Power | 95 | -240.05 | 63 | -1.39 | 55 | 3.89 | 0.00 | 1.43 | -4.78 | 19.125 | 11.125 | 3.04 |
| Rochester Gas & Electric | 96 | -261.42 | 68 | -2.29 | 41 | 4.40 | 0.00 | 1.61 | -5.95 | 25.875 | 14.250 | 9.34 |
| Central Hudson Gas & Electric | 97 | -294.93 | 66 | -2.16 | 89 | -1.37 | 0.00 | 1.67 | -8.12 | 31.875 | 16.500 | -2.13 |
| Public Service of Indiana | 98 | -534.44 | 40 | 2.04 | 57 | 3.68 | 2.07 | -0.40 | 4.08 | 17.375 | 11.250 | -36.33 |
| Northern Indiana Public Service | 99 | -591.82 | 98 | -10.73 | 28 | 5.94 | 0.44 | -0.09 | 0.53 | 12.500 | 8.000 | -9.73 |
| Centel* | 100 | NA | 83 | -4.02 | 92 | -2.26 | NA | NA | NA | NA | NA | NA |

## ALPHABETICAL LISTING OF COMPANY PERFORMANCE

| | Electric Sales | | Customers Served | | | | Revenues | | | Net Income |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Electric | | Gas | | | | | |
| Company | (KWH) (millions) | Rank | Total | % Gain | Total | % Gain | Total $ (1000's) | % Electric | % Gas | After Tax $ (Thousands) |
| Allegheny Power System* | 47,541 | 12 | 1,227,852 | 1.60 | 0 | 0.00 | 1,981,242 | 100.00 | 0.00 | 206,989 |
| American Electric Power* | 98,208 | 2 | 2,650,331 | 1.28 | 0 | -100.00 | 4,787,604 | 97.95 | 0.96 | 502,460 |
| Atlantic Energy* | 7,014 | 70 | 421,251 | 3.30 | 0 | 0.00 | 648,173 | 100.00 | 0.00 | 73,765 |
| Baltimore Gas & Electric | 22,575 | 31 | 968,468 | 2.78 | 518,280 | 0.02 | 1,809,191 | 77.04 | 22.96 | 273,692 |
| Boston Edison | 12,460 | 52 | 621,083 | 1.13 | 0 | 0.00 | 1,181,097 | 100.00 | 0.00 | 97,686 |
| CMS Energy* | 27,837 | 25 | 1,410,331 | 0.72 | 1,283,351 | 2.57 | 2,800,540 | 58.24 | 40.08 | 183,800 |
| Carolina Power & Light | 36,274 | 15 | 908,820 | 2.60 | 0 | 0.00 | 2,081,885 | 100.00 | 0.00 | 308,091 |
| Centel* | 2,624 | 96 | 135,842 | 0.19 | 0 | 0.00 | 164,024 | 99.66 | 0.00 | NA |
| Centerior Energy* | 26,342 | 27 | 1,005,753 | 0.72 | 0 | 0.00 | 1,945,541 | 99.50 | 0.00 | 390,353 |
| Central & South West* | 45,699 | 13 | 1,522,890 | 0.30 | 0 | 0.00 | 2,436,515 | 96.48 | 3.52 | 371,507 |
| Central Hudson Gas & Electric | 4,886 | 82 | 241,194 | 1.85 | 55,138 | 3.93 | 429,077 | 87.39 | 12.61 | (115,537) |
| Central Illinois Public Service | 7,290 | 69 | 305,220 | -0.02 | 156,514 | 0.16 | 590,846 | 82.04 | 17.96 | 64,080 |
| Central Louisiana Electric | 5,122 | 79 | 197,017 | 0.29 | 0 | 0.00 | 304,409 | 100.00 | 0.00 | 39,407 |
| Central Maine Power | 8,564 | 65 | 450,752 | 3.04 | 0 | 0.00 | 598,154 | 100.00 | 0.00 | 46,525 |
| Central Vermont Public Service | 3,000 | 95 | 130,052 | 2.87 | 0 | 0.00 | 208,935 | 98.35 | 0.00 | (17,014) |
| Cilcorp* | 4,609 | 84 | 182,768 | 0.27 | 185,305 | 0.92 | 454,523 | 66.03 | 30.40 | 34,240 |
| Cincinnati Gas & Electric | 17,454 | 39 | 644,855 | 1.98 | 378,690 | 1.80 | 1,357,381 | 74.01 | 25.99 | 110,207 |
| Commonwealth Edison | 67,490 | 4 | 3,096,999 | 1.21 | 0 | 0.00 | 5,673,782 | 100.00 | 0.00 | 977,651 |
| Commonwealth Energy System* | 5,997 | 76 | 320,000 | 1.91 | 211,000 | 1.44 | 612,940 | 61.00 | 37.22 | 38,093 |
| Consolidated Edison | 31,608 | 21 | 2,873,012 | 0.95 | 1,024,291 | 0.21 | 5,094,418 | 82.22 | 12.35 | 512,316 |
| DPL* | 12,665 | 50 | 438,669 | 1.34 | 271,714 | 0.87 | 941,210 | 76.33 | 22.56 | 107,902 |
| Delmarva Power & Light | 9,565 | 58 | 341,308 | 3.45 | 79,002 | 1.87 | 712,479 | 85.95 | 10.98 | 72,989 |
| Detroit Edison | 39,492 | 14 | 1,856,968 | 2.17 | 0 | 0.00 | 2,856,731 | 98.92 | 0.00 | 476,734 |
| Dominion Resources* | 52,378 | 11 | 1,648,700 | 2.04 | 139,193 | 4.36 | 3,251,200 | 94.68 | 1.34 | 430,500 |
| Duke Power | 64,751 | 7 | 1,520,709 | 2.54 | 0 | 0.00 | 3,705,784 | 99.52 | 0.00 | 445,934 |
| Duquesne Light | 13,466 | 48 | 565,536 | 0.42 | 0 | 0.00 | 888,004 | 100.00 | 0.00 | 131,528 |
| Eastern Utilities Associates* | 4,746 | 83 | 248,000 | 1.64 | 0 | 0.00 | 367,129 | 99.26 | 0.00 | 43,546 |
| El Paso Electric | 5,080 | 80 | 227,234 | 3.07 | 0 | 0.00 | 337,792 | 99.53 | 0.00 | 33,560 |
| Empire District Electric | 3,426 | 93 | 111,600 | 1.86 | 0 | 0.00 | 150,148 | 99.58 | 0.00 | 16,079 |
| Entech | 8,659 | 64 | 245,431 | 0.28 | 105,532 | 0.71 | 658,727 | 50.88 | 13.25 | 58,637 |
| FPL Group* (FP&L) | 56,592 | 9 | 2,906,829 | 4.13 | 0 | 0.00 | 4,439,232 | 94.64 | 0.00 | 402,873 |
| Florida Progress* (FPC) | 24,104 | 29 | 1,050,311 | 4.05 | 0 | 0.00 | 1,957,600 | 71.86 | 0.00 | 187,800 |
| General Public Utilities* | 36,169 | 16 | 1,782,118 | 2.29 | 0 | 0.00 | 2,673,421 | 99.92 | 0.00 | 259,097 |
| Green Mountain Power | 2,081 | 99 | 72,310 | 3.50 | 0 | 0.00 | 129,811 | 99.07 | 0.00 | 9,646 |
| Gulf States Utilities | 26,620 | 26 | 554,095 | -0.18 | 83,003 | -1.18 | 1,432,586 | 92.85 | 2.33 | 178,091 |
| Hawaiian Electric* | 7,003 | 71 | 323,536 | 2.77 | 0 | 0.00 | 566,318 | 99.53 | 0.00 | 37,809 |
| Houston Industries* | 55,911 | 10 | 1,306,328 | 0.24 | 0 | 0.00 | 3,628,213 | 82.71 | 0.00 | 434,958 |
| IE Industries* | 4,418 | 86 | 206,354 | 0.17 | 122,351 | -3.62 | 412,778 | 73.52 | 21.84 | 34,076 |
| IPALCO Enterprises* | 10,595 | 56 | 366,933 | 2.71 | 0 | 0.00 | 553,749 | 95.80 | 0.00 | 89,335 |
| Idaho Power | 11,977 | 53 | 276,261 | 0.77 | 0 | 0.00 | 394,597 | 100.00 | 0.00 | 55,223 |
| Illinois Power | 15,336 | 44 | 542,836 | 0.41 | 384,091 | 0.23 | 1,219,523 | 74.69 | 25.31 | 251,859 |
| Interstate Power | 3,982 | 90 | 156,375 | 0.40 | 45,497 | 0.58 | 262,864 | 78.58 | 21.42 | 7,792 |
| Iowa Resources* | 4,924 | 81 | 242,912 | 1.28 | 0 | 0.00 | 341,519 | 98.94 | 0.00 | 40,941 |
| Iowa Southern* | 1,938 | 100 | 93,613 | 0.12 | 37,792 | 0.19 | 118,000 | 72.00 | 26.06 | 8,742 |
| Iowa-Illinois Gas & Electric | 4,391 | 87 | 190,814 | -0.08 | 226,496 | 0.29 | 478,462 | 63.04 | 36.96 | 57,840 |
| KPL Gas Service | 9,276 | 59 | 297,133 | 1.00 | 1,046,203 | 1.32 | 1,166,458 | 40.27 | 59.73 | 84,991 |
| Kansas City Power & Light | 9,828 | 57 | 396,597 | 2.99 | 0 | 0.00 | 704,839 | 98.84 | 0.00 | 93,100 |
| Kansas Gas & Electric | 7,927 | 67 | 249,970 | 0.91 | 0 | 0.00 | 512,126 | 98.50 | 0.00 | 94,961 |
| Kentucky Utilities | 12,918 | 49 | 375,000 | 2.74 | 0 | 0.00 | 541,799 | 100.00 | 0.00 | 73,650 |
| Long Island Lighting | 15,284 | 45 | 976,928 | 1.43 | 415,629 | 1.36 | 2,072,077 | 82.95 | 17.05 | 192,312 |
| Louisville Gas & Electric | 8,667 | 63 | 313,611 | 1.27 | 238,545 | 0.99 | 635,628 | 73.99 | 25.31 | 66,695 |
| Madison Gas & Electric | 2,084 | 98 | 107,938 | 1.59 | 79,220 | 3.48 | 202,133 | 61.76 | 37.86 | 19,034 |
| Middle South Utilities* | 57,631 | 8 | 1,678,302 | 0.65 | 224,811 | -1.23 | 3,454,820 | 96.30 | 3.70 | 356,604 |
| Midwest Energy* | 3,483 | 92 | 155,341 | 0.19 | 338,056 | 2.25 | 537,820 | 41.15 | 50.04 | 33,063 |
| Minnesota Power | 8,823 | 61 | 116,704 | 0.60 | 8,826 | 0.65 | 426,145 | 90.52 | 1.75 | 64,397 |
| Nevada Power | 7,391 | 68 | 268,609 | 7.33 | 0 | 0.00 | 374,814 | 100.00 | 0.00 | 52,789 |
| New England Electric* | 19,741 | 34 | 1,204,189 | 2.46 | 0 | 0.00 | 1,448,193 | 94.85 | 0.00 | 168,772 |
| New York State Electric & Gas | 16,472 | 40 | 731,095 | 2.02 | 136,159 | 1.96 | 1,289,638 | 88.15 | 11.85 | (199,399) |
| Niagara Mohawk Power | 35,684 | 17 | 1,459,000 | 1.11 | 450,000 | 1.12 | 2,623,430 | 82.72 | 17.28 | (557,214) |
| Northeast Utilities* | 23,405 | 30 | 1,209,686 | 2.73 | 169,937 | 2.72 | 2,080,898 | 87.57 | 9.75 | 229,145 |
| Northern Indiana Public Service | 11,798 | 54 | 368,454 | 1.03 | 565,513 | 2.01 | 1,451,629 | 59.97 | 40.03 | 64,965 |
| Northern States Power | 31,641 | 20 | 1,259,846 | 2.28 | 324,445 | 2.94 | 1,770,329 | 84.59 | 14.86 | 188,264 |
| Ohio Edison | 29,710 | 23 | 1,005,121 | 1.06 | 0 | 0.00 | 1,822,100 | 98.69 | 0.00 | 364,657 |
| Oklahoma Gas & Electric | 18,854 | 36 | 634,414 | -0.77 | 0 | 0.00 | 1,064,521 | 100.00 | 0.00 | 122,094 |
| Orange & Rockland Utilities | 4,088 | 89 | 236,264 | 2.93 | 100,473 | 2.76 | 451,318 | 75.41 | 23.80 | 36,963 |
| Otter Tail Power | 3,140 | 94 | 121,671 | 0.36 | 0 | 0.00 | 167,002 | 100.00 | 0.00 | 19,179 |
| Pacific Gas & Electric | 66,558 | 5 | 3,951,474 | 2.51 | 3,245,051 | 2.74 | 7,185,701 | 71.43 | 28.57 | 577,735 |
| Pacificorp | 26,086 | 28 | 666,200 | 0.50 | 0 | 0.00 | 2,162,500 | 50.79 | 0.00 | 248,600 |
| Pennsylvania Power & Light | 32,205 | 19 | 1,097,518 | 2.27 | 0 | 0.00 | 2,088,759 | 100.00 | 0.00 | 248,035 |
| Philadelphia Electric | 30,545 | 22 | 1,416,936 | 1.45 | 325,327 | 2.15 | 3,181,464 | 88.31 | 11.69 | 448,240 |
| Pinnacle West Capital* | 14,770 | 46 | 566,384 | 3.92 | 0 | 0.00 | 1,313,438 | 100.00 | 0.00 | 284,540 |
| Portland General* | 16,449 | 41 | 544,125 | 1.70 | 0 | 0.00 | 763,763 | 99.89 | 0.00 | 113,031 |
| Potomac Electric Power | 21,668 | 32 | 611,114 | 3.04 | 0 | 0.00 | 1,332,109 | 99.51 | 0.00 | 199,175 |
| Public Service Enterprise Group* | 34,730 | 18 | 1,809,547 | 1.76 | 1,412,063 | 1.93 | 4,211,055 | 70.28 | 28.97 | 520,451 |
| Public Service of Colorado | 18,357 | 37 | 967,083 | 0.94 | 831,973 | 1.49 | 1,657,435 | 64.90 | 33.99 | 160,103 |
| Public Service of Indiana | 19,086 | 35 | 563,626 | 1.38 | 0 | 0.00 | 1,070,454 | 100.00 | 0.00 | 219,905 |
| Public Service of New Hampshire | 6,953 | 73 | 365,521 | 4.11 | 0 | 0.00 | 549,108 | 100.00 | 0.00 | (526,667) |
| Public Service of New Mexico | 6,930 | 74 | 275,046 | 2.96 | 329,688 | 2.28 | 690,097 | 67.89 | 30.52 | 83,454 |
| Puget Sound Power & Light | 15,769 | 43 | 668,392 | 3.11 | 0 | 0.00 | 729,360 | 100.00 | 0.00 | 111,582 |
| Rochester Gas & Electric | 6,996 | 72 | 317,033 | 1.57 | 250,124 | 1.91 | 731,488 | 70.46 | 29.54 | (168,711) |
| SCANA Corporation* (SCE&G) | 14,328 | 47 | 412,253 | 2.92 | 192,062 | 1.09 | 1,115,973 | 72.38 | 14.48 | 128,865 |
| San Diego Gas & Electric | 12,496 | 51 | 990,395 | 5.28 | 621,858 | 4.54 | 1,904,228 | 66.24 | 15.43 | 183,058 |
| Savannah Electric & Power | 2,472 | 97 | 104,735 | 2.53 | 0 | 0.00 | 176,092 | 99.49 | 0.00 | 22,008 |
| Sierra Pacific Power | 4,315 | 88 | 216,274 | 3.33 | 67,219 | -89.57 | 356,726 | 82.14 | 11.45 | 46,427 |
| Southern California Edison | 65,539 | 6 | 3,717,262 | 3.56 | 1,200 | -0.74 | 5,494,465 | 99.97 | 0.01 | 738,531 |
| Southern Company* | 131,343 | 1 | 3,024,188 | 2.32 | 0 | 0.00 | 7,010,365 | 99.20 | 0.00 | 554,442 |
| Southern Indiana Gas & Electric | 4,593 | 85 | 111,981 | 1.30 | 68,094 | 2.09 | 278,546 | 83.92 | 15.48 | 31,791 |
| Southwestern Public Service | 15,809 | 42 | 346,934 | -0.46 | 0 | 0.00 | 771,609 | 99.49 | 0.00 | 89,114 |
| TECO Energy* | 11,694 | 55 | 432,205 | 3.38 | 0 | 0.00 | 970,361 | 92.25 | 0.00 | 110,670 |
| TNP Enterprises* (Tex-NM Power) | 5,933 | 77 | 197,781 | 0.87 | 0 | 0.00 | 360,842 | 100.00 | 0.00 | 18,354 |
| Texas Utilities* | 77,773 | 3 | 2,094,866 | 0.97 | 0 | 0.00 | 4,082,923 | 100.00 | 0.00 | 679,976 |
| Tucson Electric Power | 6,377 | 75 | 254,194 | 3.68 | 0 | 0.00 | 471,823 | 100.00 | 0.00 | 130,844 |
| Union Electric | 29,008 | 24 | 1,052,772 | 1.65 | 108,726 | 1.42 | 1,946,411 | 96.05 | 3.78 | 297,356 |
| United Illuminating | 5,125 | 78 | 303,794 | 1.78 | 0 | 0.00 | 497,623 | 99.38 | 0.00 | 83,225 |
| Utah Power & Light | 18,053 | 38 | 522,971 | 1.28 | 0 | 0.00 | 982,797 | 99.88 | 0.00 | 139,859 |
| Utilicorp United | 3,973 | 91 | 240,021 | 60.59 | 392,526 | 2.19 | 594,860 | 38.19 | 61.81 | 27,393 |
| Washington Water Power | 3,714 | 62 | 242,000 | 0.83 | 85,000 | 2.41 | 398,509 | 82.52 | 17.48 | 51,252 |
| Wisconsin Energy* | 20,135 | 33 | 859,449 | 1.38 | 0 | 0.00 | 1,364,570 | 82.13 | 0.00 | 169,538 |
| Wisconsin Power & Light | 9,058 | 60 | 327,930 | 1.50 | 114,788 | 2.45 | 549,382 | 79.83 | 19.41 | 54,965 |
| Wisconsin Public Service | 8,351 | 66 | 312,858 | 1.72 | 166,178 | 2.00 | 580,456 | 73.98 | 26.02 | 49,020 |

| Rank | | | | |
|---|---|---|---|---|
| '87 | '86 | Company | $ Income (millions) | '87% Change |
| 1 | 1 | Commonwealth Edison | 977.7 | 4.29 |
| 2 | 4 | Southern California Edison | 738.5 | 3.45 |
| 3 | 5 | Texas Utilities* | 680.0 | 8.47 |
| 4 | 2 | Pacific Gas & Electric | 577.7 | -37.54 |
| 5 | 3 | Southern Company* | 554.4 | -37.20 |
| 6 | 14 | Pacific Service Enterprise Group* | 520.5 | 37.52 |
| 7 | 6 | Consolidated Edison | 512.3 | 0.78 |
| 8 | 7 | American Electric Power* | 502.5 | -0.93 |
| 9 | 15 | Detroit Edison | 476.7 | 26.02 |
| 10 | 33 | Philadelphia Electric | 448.2 | 141.54 |

vice, 98th, reported substantial reductions in gas revenues because a number of large industrial customers initiated direct purchase agreements with producers and lower gas rates, as well as reduced electric revenues because of lower fuel costs, the effect of accounting changes to reflect reduced federal income tax requirements and removal of its cancelled Bailly nuclear plant amortization from rates.

Among the largest revenue producers, the six largest companies are the same as they were a year ago. But there were three changes among the next four ranked companies. FPL Group, the diversified holding company parent of Florida Power & Light, moved into 7th position, up one spot from 1986. Public Service Enterprise Group, the parent of Public Service Electric & Gas, slipped from 7th in last year's ranking to 8th this year. Duke Power, which was the 12th-largest revenue producer in 1986, moved into 10th position on the strength of its 1987 performance, replacing Houston Industries, parent of Houston Lighting & Power.

### Top 100 net income fell

Net income available for common stock posted by the Top 100 Electric Utilities declined in 1987, falling 7.4 percent to $15.7-billion, only the second year of negative income growth in the 23 years *EL&P* has conducted its Top 100 survey. Income performance was only worse in 1985, when it was off 14.8 percent. In total, the $15.7-billion net income produced by the Top 100 Electric Utilities was lower than that produced in 1984 ($16.7-billion).

Moreover, as mentioned above, the 7.4-percent drop in net income included the positive effect of non-utility operations of holding companies. If you remove these non-utility operations from consideration, net income of utility-only operation of the Top 100 Electric Utilities dropped 9.2 percent.

The decline is the result of a variety of factors, including write-offs of unrecoverable plant costs, changes in accounting procedures and the effect of non-recurring and unusual expense items.

As usual, the companies recording the greatest gains in net income production were recovering from poor 1986 performances. Six of the ten fastest gainers were at the bottom of the income performance ranking a year ago and a seventh ranked 78th. These included: 1. Public Service of Colorado (96th in '86), +2,301 percent; 2. Kansas Gas & Electric (91st in '86), +1,575 percent; and 3. Portland General (95th in '86), +614 percent. Only Atlantic Energy, which ranked 9th this year with a gain of 34 percent, ranked near the top of the list (13th) a year ago.

There were numerous changes among the rankings of the largest in-

from page 3

## Mergers could save money...

shaping the industry will consolidate two-thirds of the nation's public utilities, with resulting benefits to investors and consumers. This is the first quantifiable verification of our position," said Tirello.

"Since the study proves that mergers are economically viable, public regulators now have an obligation to consumers, in our view, to facilitate them," he stated.

### How savings would be realized

The savings would come from reduced costs of handling customer accounts, energy pooling, and more efficient use of power generation and transmission assets.

Almost two-thirds ($2.02 billion) would come from the industry's improved ability to wheel power efficiently during periods of low demand. Savings from centralized and coordinated maintenance of power plants would be about $671 million, with administrative savings coming to $790 million. Other savings would result from combining utilities with relatively large disparities in rates, combining power generating mixes and administrative expenses, shutdown of natural-gas or oil-fired steam units, and mergers in service regions of at least one-million customers.

### Merger process now starting

The merger trend projected in the study is already underway, said Tirello, noting actions with PacifiCorp/Utah Power & Light, the Southern Co./Savannah Electric and Duke Power/Nantahala.

After 30 years of construction, many utilities find themselves with about 10 percent too much capacity, Tirello said. "That excess, coupled with a reduced growth in demand, requires companies to become more aggressive in seeking new customers. Companies that can't compete effectively are obvious merger targets.

### The best in 15 years

"But the industry's increased turbulence should not be mistaken for general weakness," Tirello added. "The electric utility industry has not looked better in 15 years, because two traditional killers—interest rates and inflation—have little impact now that [it] has stopped being essentially a construction/finance industry. Cash flow is up, and earnings are flat only because of regulatory caps on equity returns."

The report is entitled "Electric Utilities: The Case for Consolidation."

### Other views

Industry officials and other analysts are skeptical of Tirello's views of consolidation and say recent merger activities do not support the study's contention.

Edison Electric Institute's Richard Braatz, vice president finance and regulation, said that with annual utility revenue of $120-130 billion, the amount of savings Tirello proposes falls within the margin of error for calculating the results. That is, such mergers could cause a $3.55-billion loss.

Braatz commended the study's efforts to quantify Tirello's theories and said many of the cost savings Tirello touts could be achieved in select cases. But assumptions, such as the availability of transmission during utility peaks and how such changes would occur in light of the Public Utilities Holding Company Act, cast doubt on the study.

Increasingly, Braatz pointed out, utilities are using spare transmission capacity to more efficiently use regionally available electricity.

Michigan Public Service Commission's Michael Fielek, director of policy, said commissions generally try to encourage agreements between utilities to foster greater savings and reliability, but doubted anyone would have the statutory or political power to mandate mergers. Initiative for acquisition would have to come as it has in the past, Fielek suggested, from the utilities.

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from page 16

## Top 100 utilities...

come producers. Commonwealth Edison carried over as the largest income producer, the same as last year. Southern California Edison (2nd) and Texas Utilities (3rd) both moved up two positions from last year. Southern Company (5th) fell two positions. Public Service Enterprise Group (6th) jumped from 14th a year ago. Consolidated Edison (7th) and American Electric Power both slipped down one position from last year. Detroit Edison (9th) moved into the Top 10 from 15th a year ago. And Philadelphia Electric (10th) jumped all the way from 33rd last year.

### Common stock earnings

Average per share earnings fell in 1987 to $2.23 from $2.62 in 1986, according to final figures provided by the Top 100 Electric Utilities. This represents a 14.9-percent decline and is far below the average per-share earning of $3.27 recorded in 1984. The 1987 level is 31.8 percent below the 1984 high.

For 1987, 54 companies reported increases in earnings per common share and 45 reported declines. A year ago, 58 companies reported per-share gains. For 1984, the high-mark year for financial performances, 72 companies reported gains.

Per-share data was provided by 99 companies; Centel did not provide earnings information.

As mentioned above, the companies recording the greatest improvements in 1987 were those coming off of poor years in 1986. Only Atlantic Energy (9th) ranked near the top in 1986.

Median earnings growth rate was less than 1.0 percent. While this year's 0.85 percent gain was better than the 0.45 percent recorded in 1985, it was below 1986's 1.56 percent and substantially under the 10.32 percent median recorded in 1982, the high-mark year for earnings gains.

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JULY 1988

ELECTRIC LIGHT & POWER

EL&P

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VOICE OF THE ELECTRIC UTILITY INDUSTRY

## LATE NEWS

**San Diego Gas & Electric Co.** and Tuscon Electric Co. plan to merge. Two separate divisions would operate under a San Diego-based holding company that was unnamed as of the June 13 disclosure. Shareholders, regulators and others must approve the merger. (See story, page 15.)

**Public Service of New Hampshire** does not have to immediately start $3.5-million monthly interest payments to third-mortgage bondholders, says the bankruptcy court, a move that allows PSNH to continue its Seabrook payments. (See story, page 10.)

**OSHA can regulate utility** power plants, a federal appeals court in Washington, DC, ruled. The Edison Electric Institute argued that the 1971 National Electrical Code precludes any regulation by the Labor Department's Occupational Safety and Health Administration. A three-judge panel ruled that while OSHA cannot regulate power-generation safety conditions, it can regulate other areas, such as coal conveyors.

# Pact kills Shoreham

## *Rates could rise more than 15%; power shortage likely*

**Mark T. Hoske**
**Assistant Editor**

HICKSVILLE, NY—Long Island Lighting Co.'s "agreement in principle" with the State of New York seems likely to lead to decommissioning of the $5.4-billion, 809-MW Shoreham nuclear plant before commercial operation. In return, the utility would receive a concession package that includes 15 percent in rate hikes over three years.

Gov. Mario Cuomo gave LILCo a June 15 deadline to draft and approve the pact, or threatened to drop the deal. Joseph McDonnell, a LILCo vice president, said the utility would make every effort to meet that deadline.

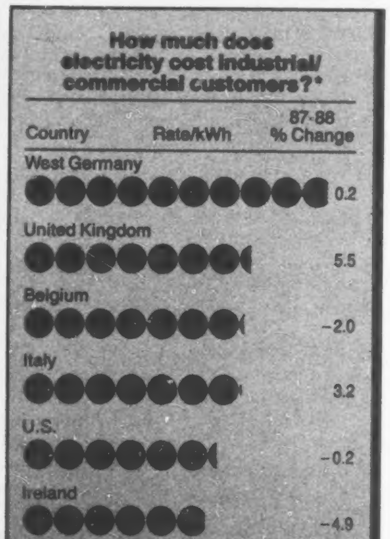
Other terms of the May 26 landmark agreement, the result of several years of on-and-off negotiations, include restoring LILCo dividends, raising senior debt to investment grade, and transferring responsibility for future generation to the state.

If LILCo directors and the state forge a final agreement approvals are needed from state legislators, public service commission, LILCo shareholders, the Nuclear Regulatory Commission, and the Internal Revenue Service. Sources indicate the needed approvals are likely and are expected within 90 days.

On May 31, LILCo rejected the state-formed Long Island Power Authority's $12/share bid. LIPA, formed to take over LILCo, had raised its bid twice from $8.75/share (*EL&P*, June, page 1).

Continued on page 12

**How much does electricity cost industrial/commercial customers?***



Source: National Utility Service, Inc., Wall Street Journal of 5/25 for international exchange rates.

*Customer rates based on 1,000 - kW demand, 450,000 kWh per month use and primary service only.

## *Company earnings fall 4.6%; sales up 4%, according to EEI*

WASHINGTON—Earnings per share of investor-owned electric utilities dropped 4.6 percent in 1987 to $2.68 per share, down from $2.81 in 1986. The decrease was partially due to write-offs from regulatory disallowances, construction-related rate actions and accounting changes, says the Edison Electric Institute.

Without the writeoffs, however, earnings would have increased by 6.4 percent. But despite the EPS decrease, the quality of earnings improved as non-cash sources decreased and sales were up, according to EEI's annual financial summary, released in late May.

Sales increased 4 percent; operating revenue increased by 2 percent to $130.6 billion, while operating expenses increased just 1.2 percent to $1.3 billion. Reasons for the slight increase include decreasing fuel expenditures and the impact of the Tax Reform Act which caused large decreases in deferred income tax expenses and investment tax credit expenses.

### Operating ratio drops for 7th year

For the seventh consecutive year, the industry operating ratio (ratio of expenses to revenues) dropped, to 78.9 percent in 1987 from 79.6 percent in 1986, mainly due to continued efficiency and cost cutting measures 'opted by utilities, :I explained.

Allowance for funds ed during construc- ›n (AFDUC) dropped percent to $5 bil-

ontinued on page 11

## 450-kV dc HQ-NEPOOL tie rises

Construction workers pour footings for a 450-kV dc tower in Goffstown, NH, part of Phase 2 of the Hydro-Quebec/NEPOOL interconnection. The H-frame, lattice-steel tower will be similar to the tower in the background. The dc line is centered between two existing 230-kV ac lines on a 350-ft right-of-way. Construction work, begun in February, will continue through 1989, with commercial operation slated for Sept. 1, 1990. The 1310-MW, $565-million, part-2 project, expands total line capacity to 2000 MW. The interconnection extends 930 miles from an H-Q substation near James Bay to the Sandy Pond substation at Ayer/Groton, MA. New England Electric System is coordinating the project.

## Dukakis: Delay new N-plants, use clean coal, other energy

WASHINGTON—Democratic presidential candidate Michael Dukakis would not support development of new nuclear plants until sufficient nuclear waste sites are found and would reopen the site selection process, giving states a larger role.

He would also support clean coal research, search for a cure for acid rain, and increase federal participation in alternate energy sources, according to his position paper on energy policy, says the *EEI Washington Letter*.

### Energy policy outline

Saying there's no energy policy now, Dukakis' stated positions are:

- Nuclear: Add no new nuclear plants without sufficient waste sites and a new generation of reactor design; lift the liability limit for nuclear utilities, contractors or others in the industry; start over with a new waste site selection process giving states a larger role; name a new NRC chairman to provide a new reorganization plan.
- Coal: Support and possibly increase clean coal research, development and demonstration; protect coal mining jobs; find answers to acid rain, greenhouse and ozone problems.
- Oil and gas: Repeal the windfall profits tax; fill the strategic oil reserve; do not use import taxes; provide temporary regional aid for oil-patch recovery.
- Alternative energy: Increase federal help for R&D for solar, biomass, wind, wood, photovoltaics and alcohol energy sources; support cogeneration and FERC's efforts to update PURPA rules.
- Conservation and efficiency: Aggressively implement the Appliance Standard Act; increase federal support; demonstrate energy efficiency in federal buildings, by installing better lighting and cogeneration, for example.
- Transportation: Increase use of ethanol and methanol for transporation, using price incentives and regulatory requirements.

# NEWS BRIEFS

**JILL MINNER,** Assistant Editor

## Braidwood 2 given full-power operating license

Unit 2 of Commonwealth Edison Company's Braidwood nuclear generating station has been granted a full-power operating license by the Nuclear Regulatory Commission. The utility said it will continue its testing program and expects the unit to be in service sometime this summer.

## Joint venture to explore for oil, natural gas

A joint venture, formed by Northern Michigan Exploration Co. (NOMECO) and Petrocorp Exploration Limited of New Zealand, is planning to search for oil and natural gas in the U.S. Gulf Coast region. The venture said it expects to spend a minimum of $5 million during the exploration phase of the drilling program, which will take place throughout 1988 and 1989. According to NOMECO's parent company, CMS Energy, five wells along the Texas-Louisiana Gulf Coast are already scheduled for drilling. Additional exploratory wells, both onshore and offshore, will be added as the program progresses. Petrocorp Exploration is a wholly-owned subsidiary of Fletcher Challenge Limited.

## Westinghouse raises its equipment prices

Westinghouse Electric Corporation's Power Equipment Division has issued an immediate, five-percent increase on all of its oil-filled instrument transformers and all bulk and condenser bushings. The company said it will honor all outstanding quotations until their normal expiration date.

## Bechtel reorganizes

Bechtel Group, Inc. (BGI) announced that it is reorganizing in order to better serve the changing needs of the utility industry. BGI said it plans to consolidate its two power companies into one operating company, Bechtel Power Corporation (BPC). The company said its new organization will consolidate management and overall corporate resources, which will result in simpler communications, improved efficiency and reduced costs. BGI Executive Vice President Cordell Hull was chosen as president of BPC. Loren Hinkelman, president of Bechtel Western Power Co., and Howard Wahl, president of Bechtel Eastern Power Co., will serve as BPC's managing directors.

## The Southern Co. forms new subsidary; Franklin named to head Southern Co. Services

The Southern Company said it plans to form a new subsidiary which will provide management and technical services for the nuclear power plants at its other subsidiaries. The new subsidiary, Southern Nuclear Operating Company, will service Alabama Power's Farley plant and Georgia Power's Hatch and Vogtle plants. "By pooling our nuclear expertise in one company, we expect to build an organization that will consistently excel in the field of nuclear operations and offer greater opportunity for the professionals involved in this specialized work," stated Southern Company President Edward L. Addison.

In other Southern Company news, H. Allen Franklin was appointed president and CEO of Southern Company Services, Inc., replacing A.W. (Bill) Dahlberg who was named president of Georgia Power. Franklin was previously executive vice president of the company. Southern Company Services, Inc., provides technical and specialized services to The Southern Company and its subsidiaries.

## ANSI president announces retirement

Donald L. Peyton, president of the American National Standards Institute (ANSI), announced that he plans to take early retirement at the end of 1988. Peyton, who has served as president of ANSI since 1966, was responsible for restructuring the former American Standards Association and developing new programs and funding. Peyton said he is retiring in order to devote more time to the development and administration of international standards programs, but that he will remain a consultant to ANSI.

## MVEA picks president

The Missouri Valley Electric Association has selected Stewart W. Smith, Jr. as its president. Smith is currently executive vice president of Union Electric Company. L.K. Vorbrich, executive vice president of Iowa Power & Light Co., was chosen as vice president of the association.

## Utilities fined by NRC

The Nuclear Regulatory Commission recently proposed the following fines:

**Arizona Public Service Co.**
A $100,000 fine for alleged violations of NRC requirements at the Palo Verde nuclear generating station.

**Baltimore Gas & Elec. Co.**
A $300,000 fine for alleged violation of NRC requirements at one of the Calvert Cliffs nuclear plants.

**Carolina Power & Light Co.**
A $50,000 civil penalty for alleged noncompliance with NRC environmental qualification requirements at the Brunswick nuclear power plant.

**Commonwealth Edison Co.**
A $150,000 fine for failing to adequately test certain equipment at Unit 3 of the Dresden nuclear power station. And a $50,000 fine for a design error at Unit 1 of the Braidwood nuclear power station.

**Florida Power Corp.**
A $50,000 civil penalty for alleged noncompliance with NRC requirements at the Crystal River nuclear power plant.

**Houston Lighting & Pwr Co.**
A $50,000 civil penalty for alleged violations at the South Texas Nuclear Project.

**NE Nuclear Energy Co.**
A $50,000 fine for alleged violations at Unit 3 of the Millstone nuclear power plant.

**Omaha Public Power Dist.**
A $112,500 fine for alleged violations of NRC radiation protection requirements at the Fort Calhoun station.

## Customers vote in favor of staying with SDG&E

Customers in San Diego Gas & Electric Company's South Laguna Beach, CA area have voted to continue receiving service from the utility. South Laguna was recently annexed to the city of Laguna Beach, which is served by Southern California Edison Company. According to SDG&E, the Laguna Beach City Council unanimously opposed asking the California Public Utilities Commission for a change in electric utility service boundaries. SDG&E customers cited lower rates, a good service history and SDG&E's community involvement as reasons for voting against the change.

## More utilities conserve with "negawatt hours"

Both Boston Edison Co. and Commonwealth Edison Co. have purchased conserved kilowatt hours or "negawatt hours" from third party conservation companies, according to Sentinel Energy Savings Corporation. The negawatt hours are usually purchased as an alternative to generated kWh or to purchasing power from other utilities. The alternative power will be used by Boston Edison for its Energy Conservation Retrofit pilot program, and by Commonwealth Edison for its pilot Residential Energy Efficiency Program. Other organizations that have started negawatt-purchase programs include: Central Maine Power Co.; Commonwealth Electric Co.; Western Massachusetts Electric Co.; Jersey Central Power & Light Co.; Metropolitan Edison Co.; Pennsylvania Electric Co.; and the Bonneville Power Administration.

## CMP helps save energy with 'buyback' program

Central Maine Power Co. (CMP) recently paid Boise Cascade Corp. $800,000 under the terms of a $2-million electric "Efficiency Buyback" contract between the companies. CMP's "Efficiency Buyback" pilot program, approved by the Maine Public Utilities Commission in 1986, allows its commercial and industrial customers to propose projects that will reduce energy use by at least 500,000 kWh per year. Projects that qualify are then eligible for a payment based either on project cost or on a reduction of the payback period of the investment. CMP said Boise Cascade qualified for the payment by contracting to reduce its energy use at the Rumford paper mill. Another 50 percent of the total payment due Boise Cascade will be paid out gradually as work progresses, and the final 10 percent will be paid when the project is completed, according to the utility.

## DP&L says it ranks first in productivity

Dayton Power & Light Co. (DP&L) said its generating plant productivity level ranks first in the nation, over 12 percent higher than the industry average. In addition, the utility has received the Institute of Industrial Engineers' 1988 Award for Excellence in Productivity Improvement. The award was given in recognition of DP&L's improvements in the productivity and efficiency of its coal-fired generating units, according to the company.

## Atlantic Group honored by Virginia Power

Virginia Power's Nuclear Operations department recently named The Atlantic Group as its 1987 Contractor of the Year. The Atlantic Group, headquartered in Norfolk, VA, was recognized for making the 'most meaningful contributions during the course of a year' in support of Virginia Power's goals, according to the utility.

## NOMECO to supply MCV with natural gas

Northern Michigan Exploration Co. (NOMECO), a unit of CMS Energy Corp., has agreed to supply five percent of the natural gas required for the Midland Cogeneration Venture (MCV), according to CMS. Under the 12-year agreement, NOMECO will provide gas at a rate of 10 million cubic feet per day when the MCV begins operating in early 1990. CMS stated that, with this new agreement, the initial gas requirements of the MCV in 1990 are now in place and over 75 percent of all gas needed by 1994 has been committed under long-term firm supply agreements. The MCV is the first conversion of a nuclear project to a natural gas-fired, combined-cycle cogeneration facility. According to CMS, the Midland Cogeneration Venture will be the nation's largest cogeneration power plant.

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# COMMENTARY

## Thoughts on the way to EEI's Washington convention

**Shoreham's demise**, if it comes, may be more a blow to the nuclear power industry than to the Long Island Lighting Co. Chairman William Catacosinos has negotiated a win-win agreement with the State of New York, all things considered. The company will receive the benefits of it's investment in the ill-fated nuclear plant, receive a return on that investment, and get guaranteed rate increases over the next three years. It also will shift the burden of power supply directly to the state. The agreement, if approved by the June 15 deadline, ensures the company's financial recovery, over time, and offers a gracious way out of what already is a tenuous power supply situation.

But abandonment of the completed, ready-to-generate plant establishes a serious precedent. Other plants, such as the completed Seabrook Nuclear Plant of Public Service of New Hampshire, or even Boston Edison's Pilgrim Station, would now seem to be at greater risk. The Shoreham solution also casts its shadow over incomplete nuclear plants at utilities whose reputations have been tarnished by poor performances and serious reprimands, such as Philadelphia Electric. The nuclear industry is far from being out of the woods.

**U.S. leadership in nuclear technology** also is slipping overseas. Britain's Central Electricity Generating Board is reported to be working with the French to come up with an advanced pressurized-water reactor design. This new design could replace planned replication of the Westinghouse-based PWR design selected for Sizewell B after only two or three units. CEGB suggests that its need for new capacity increases rapidly after the year 2000 and that there may be economies from the French design. The French unit would incorporate a single half-speed 1400-MW turbine-generator in place of the two 660-MW turbine-generators of the Westinghouse/Sizewell B concept. Also, based on demonstrated French designs of longer fuel elements, the advanced PWR units could result in a 20-percent increase in output compared to the Westinghouse design. The French nuclear program, the most ambitious in the world in recent years, has slowed, but there's been little decline in its research-and-development efforts, efforts backed by aggressive demonstration programs. The U.S. may still have technological leadership in many areas, but our inability to continue to demonstrate new technologies has cast a shadow.

**Transmission access** is considered a must by non-utility proponents of cogeneration and independent power production. Such access, they argue, is essential if free competition in the marketplace is to exist, as contrasted with the current protected markets guaranteed to utilities in return for accepting regulation. So vital is transmission access to development of non-utility power generation, that Federal Energy Regulatory Commission members now are suggesting their own proposed rulemakings on competitive bidding and independent power production cannot survive as proposed unless transmission reform is completed first.

Investor-owned utility leaders are deeply concerned that simplistic regulatory approaches to providing easy access to markets for non-utility generators can destroy the carefully planned and balanced movement of power on the transmission grid...a balance that produces a reliable power supply. Such free access, uncoordinated and without commitment to balance operations, can ultimately only prove to be an expensive inconvenience to all users of the transmission systems involved.

**Maglev trains** have been discussed for years, but now there's a possibility that the first U.S. demonstration of magnetic levitation technology could be operating in Florida by 1992. Several high-speed train routes have been discussed for the Sunshine State, but receiving the greatest show of interest is the one that would run 20 miles from the Orlando airport to Disney World (where else!). The $700-million short-line system has been offered franchise rights by the state of Florida, but no funding. The state also has offered fast-track environmental permitting. The Maglev of Florida consortium, a Japanese group, would employ low-temperature superconductivity technology currently being developed by Japan's Railway Technical Research Institute. So far, the consortium has acquired most of the required rights-of-way and says it could build the system in two to three years. Whatever happened to American ingenuity and entreprenuership?

*Robert A. Lincicome, Editor-in-Chief*

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# LETTERS

### Late night at the old power plant

With power plant operator alertness ranking high as a serious electric utility industry concern (evidence *EL&P's* ongoing series of articles on the subject of shift work in the May 1988 issue), the problem seems toughest on the night shift. It's no fun subduing one's nocturnal urges to snooze. And rotating shifts compound the problem. Perhaps these anecdotal glimpses from my late-night shift experiences in a coal-fired plant thirty years ago contain some germs of thought applicable to today.

By observation I learned that success in maintaining all-through-the-night plant-operator alertness lay with the varied personalities of the individuals on a given shift roster. There was the control room operator, a member of a fraternal organization known for its marching bands, who brought in his clarinet to practice for upcoming parades. Speculation had it that this was his wife's idea. Irritation was the operative word for this technique. None could sleep with that raucous squawking and squealing! An important point here was his use of a musical instrument of the woodwind family. These have an especially high *co-efficient-of-irritation* when played by the average control room operator.

Then there was the cagey, old watch engineer who ruled by intimidation. He would leave his little shanty of an office on the turbine deck to creep surreptitiously out into the plant, and change the set-point on, say, a heater drain level controller. He then stole back to his lair to watch his clock, measuring how long it took his operators to detect and react to the change. None dared sleep! In the use of this technique it is important not to 'mess' with a critical plant system. Otherwise, the ruckus associated with a plant trip will awaken many more people than just the plant operators. And who needs a phone call—while the plant is still writhing in the throes of the trip—from the local pain-in-the-butt who jingles the control room telephone to express displeasure at being roused from slumber with the lifting of the safeties.

But the night watches on which all hands were widest awake—AND VOLUNTARILY AT THAT—were those where at least one of the crew on duty was either a 'real character' or 'philospher'. (If the world only knew how many of society's ills are resolved at impromptu, all-night, night-shift forums!) And if the character/philosopher happened to be the top-ranking man on the watch, so much the better!

One such individual was a short, rotund, gregarious raconteur of a watch engineer whom I'll call Newton Griffith. "Griff" dressed for his role by wearing a traditional, wonderfully-nostalgic power engineer's costume: light-gray, starched, pressed and pleated, chino-cotton "blouse" ("It's *not* a SHIRT," feisty Griff would retort) with billowing sleeves; charcoal-gray, heavy-twill trousers; wide, black leather belt; a bandana-type handkerchief from his assortment of many in the traditional patterns and colors, each selected to match Griff's particular mood of the day; polished, black leather work shoes; topped off by a gray and white striped, also pleated, duck-billed power engineer's cap. Heavy-duty work gloves—with long, stiff, protective arm cuffs—were ever present, as was his stogie cigar.

As "the old man" on watch, Griff set the tone for his shift. First, he employed a patently no-nonsense approach to putting outstanding plant 'business' to bed. Only then, when all shift turn-over items were properly attended to, would he loose his propensity to pontificate to keep the men on his shift from nodding off. Assuming 'center-stage' in the control room, Griff channeled his natural abilities into a technique that proved to be the most successful for shift crew alertness. He regaled us with true-to-life stories—ribald and otherwise—like you wouldn't believe!

One such tale has stuck with me down through the years. It was the time Griff's 'old lady's' cat went doo-doo in one of his work shoes. And "wouldn'cha know", it happened on a night that he was late for work. No problem. Griff simply, as he told it, sent the critter to kitty heaven by whirling said tabby overhead by its tail, letting go just as the right amount of centrifugal force had built up, and then—to assure its being a one-way trip—assisted the process at the precise apogee of cat's trajectory with a charge from his 12-gauge shotgun! Of course, there was no way of actually verifying if Griff ever really played skeet-shoot with the house cat. But at 4 o'clock in the morning, no one particularly cared!

*Peter Kushkowski*
*Northeast Utilities*
*Haddam, CT*

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### Getting utilities' nuclear acts in order

It *is* about time! We have searched all of the trade publications for months for some indication of optimism.

Here are some of the utilities problems.

1. The era of doubling system loads every ten years is over.

2. It takes too long to get a nuclear plant on line and too long to load the big machines.

3. 'Worst case' reactor failures have not affected the public but still pose serious capital investment risks; we still need to convince the public about safety.

4. Cogeneration is here to stay, but questions remain regarding reliability, FERC and PURPA regulations.

5. Worries continue about nuclear related failures; low-steam conditions, capital intensive costs and risks, and spent fuel disposal, even liquidation. These are monumental time consumers for nuclear executives.

*Problem #1.* The first responsibility is to make existing nuclear plants secure. The simultaneous responsibility is to plan for the use of 'Advanced Reactors,' since we all know that we can expect to face restrictions on all fossil fuels within a dozen years.

In our world-wide experience in the technical, administrative and financial disciplines, many developments have come to our attention. For the past 24 years, it has been my privilege to serve on the Board of Directors of the Metropolitan Water District of Southern California. During these years I have served as Chairman of the Engineering and Operations Committee and presently as Chairman of the Energy and Desalination Committee. At Metropolitan, we recognize that our next water supply must come from sea water desalination via cogeneration and nuclear power. Just after the turn of the century, the population in Southern California is expected to reach 18 million from the present 14 million.

In the late sixties we saw the first helium cooled reactor in West Germany, and the first helium cooled reactor installation in 1974. Helium is the key word; here is an inert element that does not become radioactive and has developed to give us 'fossil fuel' steam conditions, 1000 degree F and 2400 psig, for

Continued on page 13

# Utilities top industrials' investment value, says NARUC

WASHINGTON—Common stockholders of almost 75 percent of all major electric and telephone utility companies earned a higher return on their investments than those of major U.S. industrial corporations from 1972 to 1987, says a recent study by the National Association of Regulatory Utility Commissioners.

The 55-page study concludes that utility companies were less risky and more profitable investments for common shareholders than the average non-regulated corporation over the past 16 years. It also suggests that the superior earnings for shareholders of utility investments may ultimately translate into a lower cost of capital for utility companies and lower utility rates for consumers.

Ten telephone companies were included in the 103 utilities analyzed.

Consolidated Edison Co. of New York, the utility with the highest average, returned 23.4 percent on common shareholders' investments, while General Public Utilities, owner of Three Mile Island, returned the lowest average to investors at 4.6 percent.

That ConEd had both the highest electric rates and the highest shareholder return on investment was a coincidence, said Mike Foley, NARUC's director of financial analysis and the report's author. There's no correlation between shareholder rate of return and electric rates, he explained. LILCo, he pointed out, has one of the highest electric rates, but one of the lowest shareholder rates of return.

Shareholder returns, as measured by changes in stock prices and cash dividends paid to common stockholders, were used to calculate the average internal rate of return for investors.

The formula for internal rate of return accounts for the timing and amount of dividends, Foley explained. Utility stocks generally pay higher dividends than do industrials, but gain market value more slowly, so usually return smaller capital gains when shareholders sell, he said.

### Average rate of return

The study found that electric and telephone utility stockholders earned an average internal rate of return of 13.13 percent, while the Standard & Poor's Index of 400 Industrials returned 11.46 percent, and the Value Line Industrial Composite returned 11.78 percent during the period.

Foley said the study considers federal income tax law changes as they relate to capital income, the total earnings on investment for shareholders, including dividends.

### Turnaround for 1987

Despite the better performance utilities showed over 16 years, industrials outperformed utilities during 1987, explained Mark Luftig, an analyst with Salomon Brothers Inc. Utilities, however, have regained the advantage over the S&P 500 this year, Luftig said.

The NARUC study starts from utilities' low period of the early 1970s, Luftig noted. Utilities have benefitted from low interest rates, but that advantage is slipping away as rates creep upward, he added.

### For a copy

The study, "Electric and Telephone Utility Stockholder Returns: 1972-1987," may be obtained for $15 from NARUC, P.O. Box 684, Washington, DC 20044.

**Highest Shareholder Av. Ret. '72-87**

| Rank | Company | % |
|---|---|---|
| *1.* | *Consolidated Edison Co.* | *23.44* |
| *2.* | *Tucson Electric Power* | *21.35* |
| *3.* | *So. California Edison Co.* | *18.39* |
| *4.* | *Potomac Electric Power* | *18.12* |
| *5.* | *CP National Co.* | *18.00* |

**Lowest Shareholder Av. Ret. '72-87**

| Rank | Company | % |
|---|---|---|
| *103.* | *General Public Utilities* | *4.61* |
| *102.* | *Public Service of Indiana* | *4.67* |
| *101.* | *Northern Indiana PS Co.* | *5.38* |
| *100.* | *Long Island Lighting Co.* | *5.93* |
| *99.* | *CMS Energy* | *6.77* |

# SDG&E, TE to merge; judge opposes UP&L

SAN DIEGO—San Diego Gas & Electric Co. and Tuscon Electric Co. plan to merge into two divisions operating under a new San Diego-based holding company, unnamed as of the June 13 joint announcement.

In a separate merger development, an administrative law judge of the Federal Energy Regulatory Commission opposed the combination of PacifiCorp and Utah Power & Light, saying the predicted benefits may not outweigh the costs. The commission may vote against the judge's recommendation later this summer.

SDG&E and TE shareholders, the California Public Utilities Commission, the Arizona Corporation Commission, FERC, and others must approve the SDG&E/TE merger.

That agreement would exchange each common share of TE for 1.725 shares of the new company, while SDG&E common shares would exchange one-for-one. Outstanding issues of both preferred and preference stock would be exchanged for similar issues in the new company.

At the time of the merger, SDG&E shareholders would own 56.5% of the stock in the new company, while TE shareholders would own 43.5%.

### Top management

Thomas A. Page, SDG&E's president, chairman and CEO would become chairman and CEO, while Einar Greve, TE's chairman, president and CEO, would be president and chief operating officer.

The two utilities would continue operations as separate divisions within the new corporation, whose headquarters would be in San Diego.

Page said the combination would reduce the costs of customer service through improved use of resources and assets of the two companies. "It simply makes good business sense," Greve predicted the consolidation would improve transmission opportunities, providing access to the Western U.S. and Mexico.

At the end of 1987, TE had assets of $2.1 billion; 254,000 customers; revenue of $472 million; and net income of $135 million, including returns from subsidiaries. SDG&E had assets of $3.6 billion; 1-million customers; $1.9 billion in revenues; and net income of $197 million, including that from subsidiaries.

### PacifiCorp, UP&L set back

PacifiCorp and UP&L will have a month to respond to the 250-page recommendation prior to FERC's vote at a still-unscheduled hearing later this summer.

Patrick Slattery of PacifiCorp said both companies maintain that merger benefits are substantial and compelling. He expects the companies to respond to each of 91 points that the judge listed in the recommendation.

"We continue to remain optimistic," Slattery added. Four state regulatory commissions have approved the merger, and three have yet to decide.

# Major energy shortages anticipated in 1990s, says survey

WASHINGTON—Sixty-two percent of the public and 73 percent of energy opinion leaders said major energy shortages are likely over the next decade or so, while more than 25 percent of each group said shortages are very likely, says a national survey on U.S. energy poliel released in June by the League of Women Voters Education Fund (LWVEF) and Gallup Organization Inc.

In March, LWVEF surveyed 271 representatives of the energy industry, and environmental and consumer advocael groups. The public opinion survey, commissioned by LWVEF, was conducted in December 1987 by Gallup.

Eighty-eight percent of environmental and consumer advocates and 75 percent of industry respondents rated federal policies and programs of the past 10 years either "somewhat ineffective" or "not at all effective" in ensuring adequate future energy supplies.

Industry and public-interest respondents agreed that achieving energy self-sufficienel should be an important consideration in national energy poliel. Eighty-two percent of the opinion leaders either "oppose" or "strongly oppose" increasing U.S. dependence on imported oil to meet energy needs.

Expanding use of natural gas drew support from 71 percent of respondents from the public and 88 percent from industry. Almost all of the opinion leaders favored energy-efficient technologies and conservation measures as ways to meet future energy needs. Both groups favored more hydroelectric power, solar energy, photovoltaics, geothermal energy, cogeneration and alternative fuels.

Fifty-three percent of the general public would not relax environmental controls to produce more energy; 96 percent of the public interest leaders surveyed agreed; 52 percent of the industry respondents favored doing so in order to produce more energy.

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# Plant operating expenses worry top N-executives

CHICAGO—The top issue facing more than half of U.S. and Canadian nuclear utility executives is plant operating costs, according to a recent survey by Cresap management consultants.

Nuclear Regulatory Commission "ratcheting" was ranked as the second-highest concern among the respondents, but with about a third of the weighted score of operating costs.

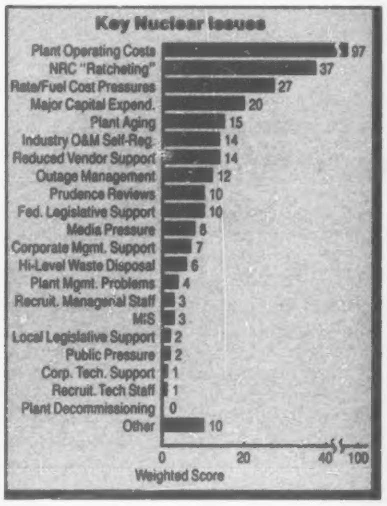
**Key drivers**

"Recognition that management matters are the key drivers of plant performance and cost is finally taking hold," explained Leonard R. Wass, vice president and head of Cresap's Energy Practice.

More than half of the U.S. and Canadian nuclear licensees responded. About 80 percent had nuclear line management responsibility, and more than 60 percent had titles of vice president or above, cited Cresap.

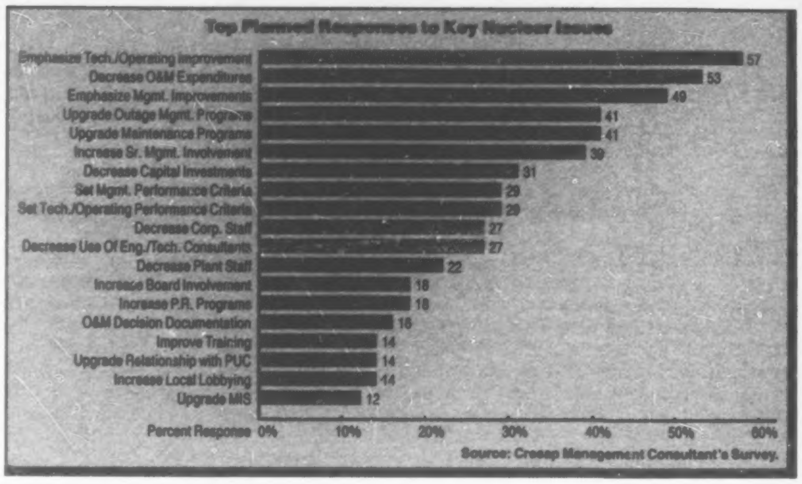
None of the respondents chose plant decommissioning as a key issue, while pressure from the public and media ranked very low as concerns, in comparison.

With concerns focusing on plant operating costs, it's not surprising that the top planned response selected was to emphasize technical and operational improvements. That choice was selected by 57 percent of all respondents and by 73 percent of those responding to plant operating costs as the key issue.



**Financial issues**

With three of the four top issues selected being financial in nature, nuclear utilities recognize the importance of controlling operating costs, Wass added. Over half indicated that they plan to decrease operating and maintenance expenditures.



Source: Cresap Management Consultant's Survey.

## *Underwater robot cleans tank bottoms at Susquehanna 2*

COLUMBIA, MD—Pennsylvania Power & Light Co. recently used a remotely controlled underwater vehicle, called a Superscavenger, to clean materials from the bottom of a condensate storage tank at its Susquehanna nuclear plant.

ALARA considerations played a major role in the company's decision to use a telerobot, rather than employ divers to clean the tank bottom. The underwater robot, which was developed by ARD Corporation, was equipped with an underwater video camera and lights. It was maneuvered by an operator who controlled the device's movement across the 40-ft round tank using a television monitor installed in a remote control station.

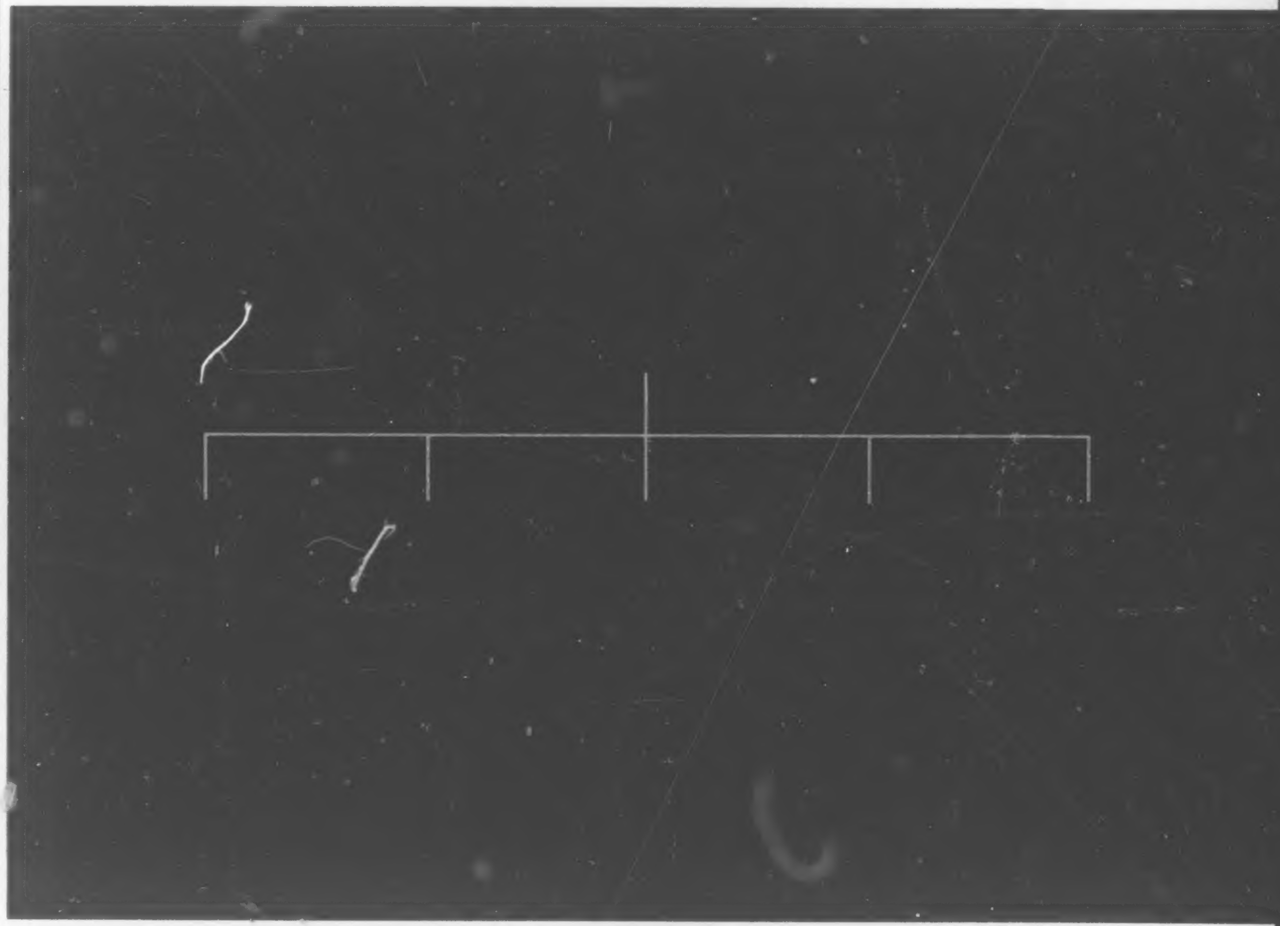
The waste recovered was processed through a portable demineralization system.

**Preparation**

Preparation for the operation involved detailed planning by the utility and involved detailed procedures, writing, staff approvals and equipment setup and hydrotest.

The actual cleaning operation was completed in over two crew shifts.

When it's time to cut costs, call Wyle.



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AUGUST 1988

ELECTRIC LIGHT & POWER

EL&P

Volume 66, Number 8
A PENNWELL PUBLICATION

VOICE OF THE ELECTRIC UTILITY INDUSTRY

# TVA cuts work force by 20%

## 7500 let go; 3-year rate freeze; competition is key

KNOXVILLE, TN—In his first major action as TVA administrator, Marvin Runyon announced staff and contractor cuts of 7500 employees, 20 percent of the authority's work force. The reductions are to be completed by October as part of an overall reorganization.

In addition, the two Bellefonte nuclear units will be mothballed and work will be slowed on several other plants to focus efforts on TVA's nuclear restart, said the June 29 announcement.

Runyon, who took over at Tennessee Valley Authority in December 1987, said the cuts and restructuring would allow the utility to avoid rate increases for three years.

The initial estimate for next year's costs would have required $300 million more from ratepayers—about a 6-percent increase, Runyon said. Over the past three years, TVA has had an average annual rate increase of about 4.5 percent.

### Reaction

Tennessee Governor Ned Ray McWherter said in a statement that a cabinet-level working group was established, with state representatives from labor, employment security and economic and community development, to extend the full resources of the state to the people affected by the TVA cuts.

"We welcome anything that TVA can do to improve efficiency and keep rates within a competitive range," said Ken Renner, a spokesman for McWherter.

Continued on page 18

## LATE NEWS

**Utah Power & Light Co.** and PacifiCorp cleared regulatory approval in Utah, the fifth of seven states to approve the $2-billion merger. Washington, Oregon and the Federal Energy Regulatory Commission must still OK the deal.

**Seabrook received favorable** review on its evacuation plan, says initial results from the Federal Emergency Management Agency, which evaluated the two-day drill. Top Public Service of New Hampshire officials said that since the bankruptcy protection filing, all things—even their 36.5-percent stake of the plant—are being considered. They said, though, that a compromise closure, like the one that prevents Long Island Lighting's Shoreham plant from opening, is unlikely.

**Texas Utilities Co.** and a citizens group reached an agreement that could expedite licensing of the $9-billion Comanche Peak nuclear plant.

**Boston Edison Co.** asked the NRC to inspect its Pilgrim nuclear plant to prepare for restart.

# Top 100 reversed some of their operating trends in 1987

Beginning on page 13 is *EL&P*'s 1988 Top 100 Operating Performance report, presenting the 1987 operating data from the 100 largest investor-owned utilities. The report may contain some surprises, even for those intimately familiar with the field.

Not surprisingly, coal usage by the top utilities increased in the year under consideration. In a similar vein, oil and natural gas consumption dropped, but oil much more precipitously. Utility executives and staffs probably felt comfortable with these trends.

They also probably felt reasonably secure with the minor changes in the mix and relative amounts of the different types of generating plants. Many undoubtedly foresaw the flat results in available, conventional, steam plant capacities and the increase in gas-turbine and internal-combustion plants.

And who among them could be worried by the increase in transmission and distribution line miles? Not many.

But, whether foreseen or not, they had to be discomfitted by the increases in seasonal peaks and the concomitant drop in reserve margins—both for owned and total system capabilities. Enough new plant is not being planned or built. And the public seems to be resisting those that are planned.

New nuclear plans are dead or dying. New baseload plants are almost prohibitively expensive, in capital costs and public-relations costs.

The report gives no answers, but reading it closely just may lead to asking some of the right questions.

# Supreme Court upholds MSU's rate hike, clarifies FERC power

WASHINGTON—In an action strengthening Federal Energy Regulatory Commission power over state regulators, the U.S. Supreme Court overruled a Mississippi Supreme Court decision that would have cancelled a $326.5-million rate increase for a Middle South Utilities Inc. subsidiary.

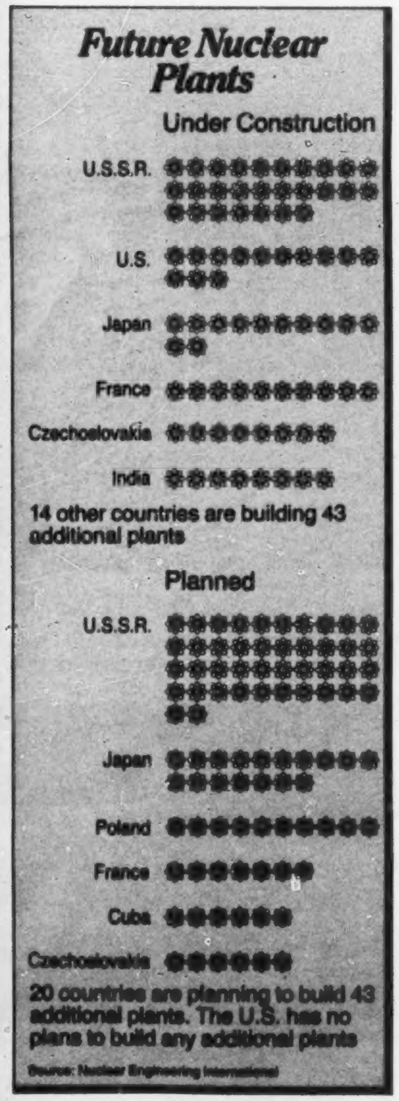
The decision not only assists a financially struggling Mississippi Power & Light Co., but also ensures that state regulators defer to FERC in the matters of setting of wholesale rates and dividing resources among utilities in power pools.

The 6-3 ruling written by Justice John Paul Stevens sustained a retail rate increase granted to MP&L by the Mississippi Public Service Commission in September 1985. That increase was based on a 33-percent allocation of Grand Gulf 1 nuclear plant costs to MP&L by FERC. The decision overruled the February 1987 state supreme court decision that would have given the MPSC the authority to determine the prudence of MP&L Grand Gulf costs before allowing retail rate relief.

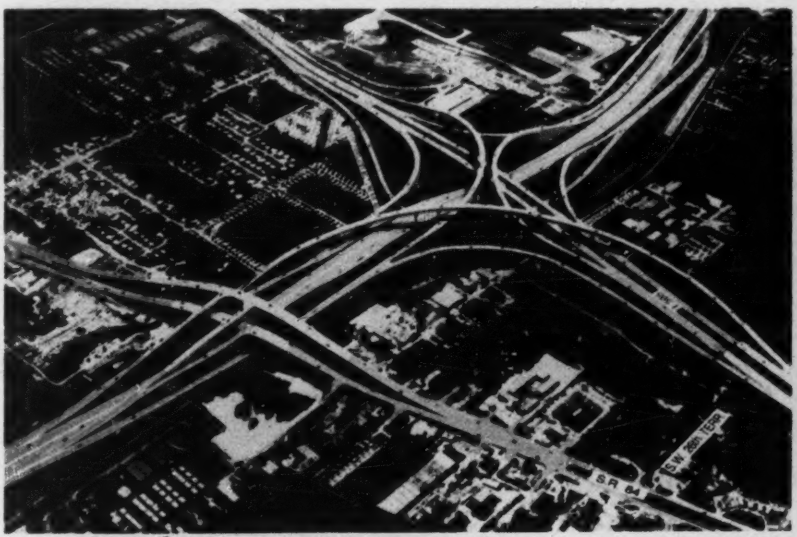
Edwin Lupberger, chairman and president of MSU, said the ruling removes a major financial cloud that had oomed over the company.

"The decision removes any doubt about the legality of

Continued on page 12



## Why is FPL interested in this photo?



Why is a utility like Florida Power & Light getting involved with the construction of the I-595 Port Everglades Expressway, Broward County's first east-west highway? Because the highway represents the largest relocation of utility facilities in FPL's history. A major effect is that transmission and distribution lines have to be moved. FPL had to install four new 155-ft transmission poles to accommodate the height of just one of the 14 interchanges. And, the first Dept. of Transportation plan called for a road right through a substation. An alternate routing was agreed on after FPL engineers spotted the problem. FPL expects to finish its work connected with the highway by early 1990. Construction management services consultant on the project, Kaiser Engineers Inc., points out that the highway is Florida's largest-ever public works project. It will be fully open in 1991.

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# NEWS BRIEFS

**JILL MINNER,** Assistant Editor

## International energy pact signed by U.S.

The Department of Energy has signed a pact drafted by the International Energy Agency (IEA) which calls for participation in the joint collection and dissemination of data on successful energy-efficient demonstration projects. Other nations that have signed the pact include: Austria, Denmark, Finland, Germany, Italy, Japan, the Netherlands, Norway, Portugal, Sweden, Switzerland and the United Kingdom. According to DOE, New Zealand is expected to sign the pact as soon as the country's parliament approves the move. As part of the agreement, the participating countries will fund a unit established in the Netherlands called the IEA Center for the Analysis and Dissemination of Demonstrated Energy Technologies. The unit will be used to gather and analyze data on projects in energy-efficient technologies, and will provide reports on the performance of demo projects, policy implications and market choices facing manufacturers and consumers. The unit will also be used to organize international seminars and conferences on practical applications for new technologies.

## Boston Edison reports on Pilgrim's progress

Boston Edison Co. told the Nuclear Regulatory Commission (NRC) that, with the exception of a few remaining steps, its Pilgrim nuclear power plant is ready to restart and operate reliably. According to Boston Edison, the remaining steps include: 1) the NRC Integrated Assessment Team Inspection; 2) approval by the Boston Edison Board of Directors; and 3) permission to restart from the commission.

## CMS says last financial steps taken for MCV

CMS Energy Corp. announced that the final agreements for the Midland Cogeneration Venture Limited Partnership have been executed. CMS said the agreements include equity contributions by its partners and completion of a $650-million bank loan. The loan was made to MCV by The First National Bank of Chicago and three co-managers: Swiss Bank Corp.; Algemene Bank Nederland N.V., Chicago branch; and the Bank of Montreal. Construction work began on the plant in April and commercial operation is scheduled for the first quarter of 1990, according to CMS.

## Taxes still rising for PA public utils, says study

A recent study, conducted by the Pennsylvania Economy League (PEL), shows that state and local taxes paid by public utilities in Pennsylvania continue to grow in relation to the amount paid by other business and industry. The report, an update of PEL's 1982 study, is being printed and distributed by the Pennsylvania Electric Association (PEA). Although the rate of increase in utility tax payments has slowed, PEA says it still is higher than the rate of increase in total corporate taxes. "The electric utility industry's concern is that our customers, by law, pay in their rates the cost of providing service, which includes taxes," explained PEA President Vincent Butler. "...there are ethical, equity and public policy issues involved when taxes are levied against utilities," he continued. According to Butler, PEA hopes the study will bring attention to the need for tax reform in Pennsylvania.

## CommEd says Zion-2 set generating record

Commonwealth Edison Co. announced that unit 2 of its Zion nuclear plant has become the first U.S. nuclear unit to generate 80 million MWh of electricity. The unit went into service in 1974 and has been operating continuously since October 1987, according to the utility.

## Westinghouse to build low-level radwaste disposal facility in IL

Westinghouse Electric Corp. said it has been selected by state officials to build and operate a low-level radioactive waste disposal facility in Illinois. Under the terms of the contract, Westinghouse will design, construct, operate and, after 50 years, close the facility. Sargent & Lundy Engineers and Earth Technology Corp. will work with Westinghouse on the project. According to the company, its facility must be ready to receive low-level waste from Illinois and Kentucky by Jan. 1, 1993. Westinghouse said the final site selection will be made late next year.

## O&R, IBEW agree to a three-year contract

Orange & Rockland Utilities, Inc. and employee members of the International Brotherhood of Electrical Workers have agreed to a three year contract. "From the outset of negotiations, a primary goal was to reach an agreement that best serves the interests of our customers. We've achieved that goal," stated Linda Winikow, O&R vice president of human resources and external affairs. The company said that union members had voted to ratify the agreement in June, following extended negotiations.

## Women in Energy, Inc. celebrates anniversary

Women in Energy, Inc. will celebrate its 10th anniversary this month at the National Energy Conference in Wichita, KS. Scheduled speakers will include: U.S. Sen. Nancy Landon Kassebaum (KS); Dixie Lee Ray, former chairman of the Atomic Energy Commission and Governor of Washington; and Margaret N. Maxey, of the College of Engineering, University of Texas-Austin. Founded in 1978, Women in Energy, Inc. is a communications network designed to promote research, knowledge and understanding of all forms of energy.

## Utilities fined by NRC

The Nuclear Regulatory Commission recently proposed the following fines:

**Commonwealth Edison Co.**
A $50,000 fine for violation of NRC security requirements at the Braidwood nuclear power station.

**Illinois Power Co.**
A $75,000 fine for failure to adequately test certain electrical components installed at the Clinton nuclear power station.

**Southern California Edison**
A $150,000 fine for alleged violations of NRC requirements governing environmental qualification of electrical equipment important to safety at Unit 1 of the San Onofre nuclear generating staion.

**Tennessee Valley Authority**
A $50,000 fine for two violations of NRC requirements which occurred during heatup of Unit 2 at the Sequoyah nuclear power plant.

## Personnel changes announced at EEI

The Edison Electric Institute has named Thomas R. Kuhn executive vice president and chief operating officer. Kuhn previously served as EEI executive vice president-governmental affairs. Walker F. Nolan, formerly vice president-legislative affairs, was chosen as senior vice president responsible for governmental affairs activities. Others named to new posts include: Fred I. Denny, vice president-environment, fossil fuels and power production; and Peter B. Kelsey, vice president-law and corporate secretary. Kelsey will start on November 1. "These changes are part of EEI's strategic plan to meet the needs of the electric utility industry and better serve its members," said EEI President William McCollam Jr.

## ANS officers named

The American Nuclear Society has elected Walter B. Loewenstein, of the Electric Power Research Institute, as its vice president/president-elect for 1988-89. E. Gail de Planque, of DOE's Environmental Measurements Laboratory, took over as president. The officers were elected at the ANS annual meeting in San Diego.

## WPPSS reelects Halvorson as chairman

The Washington Public Power Supply System has reelected Carl M. Halvorson as chairman of its executive board, a position he has held since 1982. Other board members who were also reelected include: Paul Nolan, vice chairman; Cornelius Duffie, secretary; and Vera Claussen, assistant secretary.

## Rancho Seco training programs receive national accreditation

According to the Sacramento Municipal Utility District, its Rancho Seco nuclear plant has been made a full member of the National Academy of Nuclear Training. Ten of Rancho Seco's training programs have now been accredited by the academy. "The accreditation places Rancho Seco in the top third of all U.S. nuclear plants for accredited training programs," noted Rancho Seco Nuclear Training Manager Paul Turner. "We have spent approximately three years analyzing and developing the programs necessary to meet the academy's extensive training requirements," he added.

## WE provides economic development profiles

Wisconsin Electric Power Co. (WE) and the Southeastern Wisconsin Regional Planning Commission together profiled 60 cities, villages and towns in southeastern Wisconsin to promote economic development in the area. Information on population, income, education, taxes, housing, labor recreation and other pertinent factors are detailed in the profiles, as well as maps and graphs for reference. WE Economic Development Manager Kris Rappe said the profiles, "...can provide a company with much of the preliminary information it needs to assess a community and its development sites for business purposes." "We intend to use these profiles as part of our own ongoing economic development marketing efforts as well," Rappe added. "These are invaluable tools that will help communities market themselves as prospective business sites."

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**EL&P readers whose responsibilities include both Generation and Transmission/Distribution receive both technology sections. Other readers receive the technology section that applies to their respective area of responsibility. The Generation edition is indicated by a single dot (·) in the upper right corner of page 1; the T/D edition carries two dots (··). All readers receive EL&P's industry news section.**

# AEP slams NY-OH acid rain compromise proposal

COLUMBUS, OH—Ohio Gov. Richard Celeste and New York Gov. Mario Cuomo announced a clean-air proposal as a compromise to legislation now stalled in Congress. The proposal aims to reduce deposits from sulphur dioxide and nitrogen oxide emissions by nearly 50 percent over the next 10 to 15 years.

But American Electric Power said its customers' bills would have to increase by an average of 15 percent over its seven-state service area to pay for the proposal. Residential and commercial customers would see increases of about 12 percent as a result of the June 6 Ohio-New York proposal, AEP said.

In addition, AEP warned that the cost of the proposal would end near-term investments in the nation's clean coal technology program.

"Our proposal reflects an agreement between the state that is the source of the greatest amount of sulphur dioxide emissions and the state that suffers the greatest adverse effect," Cuomo explained. "We hope it will break the congressional deadlock on acid rain."

Congress is considering various amendments to the Clean Air Act, including acid-rain legislation. Proposals are still in committees because of disagreements over the type and extent of the legislation. Included are proposals to substitute conservation for correction reducing utility expenses, but hitting mining interests hard.

But W.S. White Jr., AEP chairman, spoke out strongly against the governors' proposal. "As we have said many times, severe acid rain legislation would deal a crippling blow to some industries in the AEP service area at a time when they can ill afford it and at a time when our nation needs to enhance our industrial capability," he said.

Without federal cost-sharing, beginning in 1993, industrial customers of Ohio Power Co., an AEP subsidiary, could get a rate increase of as much as 24 percent, noted the utility.

"It seems so short-sighted to be required to spend limited capital funds on emission control systems for existing power plants rather than spending money on developing new ways to burn our nation's coal cleanly," White said. "You still have an old power plant when you're finished, and you don't have clean coal technology, either."

### Would force PFBC cancellation

The Celeste-Cuomo proposal would offer new oil-import tax revenues to pay half the cost of scrubbers on existing plants, but would leave the annual operating and maintenance costs to utilities and their customers. The total cost of building and operating the new equipment would be paid 75 percent by customers and only 25 percent by a new imported oil tax.

White said if a proposal similar to that of the governors were passed, AEP would have to cancel its plans to build the nation's largest pressurized fluidized-bed-combustion facility at its Philip Sporn Plant, as announced May 20.

### Proposal includes oil import tax

The joint proposal would:

- Create a 10-year, $2.5-billion, 50-percent matching-grant program for the demonstration of new clean coal technologies.
- Link acid rain controls with a program to expand the capacity and the fill rates for the Strategic Petroleum Reserve. It would increase the SPR to 1-billion barrels.
- Require petroleum importers to set aside 2 percent of all imports, or their equivalent, for placement in SPR. By shifting the cost of the reserve from taxpayers to oil importers, the proposal in-

Continued on page 12

# *Utility pay rises 4.5% in 1988, lowest of all industries*

NEW YORK—Utilities will increase salaries less this year than companies in the manufacturing, insurance, commercial banking or trade industries, according to The Conference Board's annual private-sector salary survey.

Pay hikes for the salaried U.S. workforce will average 5 percent this year and will be about the same in 1989. Comparatively, utility salaries will increase 4.5 percent this year and 4.7 percent in 1989.

Salary hikes will be largest in the insurance industry, where gains are expected to average 5.8 percent this year and 5.7 percent in 1989, the Board said.

### Budgets held steady over two years

Salaried budgets have held even over the last two years, following almost steady declines from 1982 to 1986. For 1988, salaries of exempt workers will rise an average of 5 percent, the Board said.

The average increase in executive salaries will be 5.4 percent. Non-exempt salaries will gain 4.8 percent. Projections for next year are virtually the same in all three groups.

"Management appears determined to keep average salary increases to about 5 percent and not permit an upward escalation," noted Charles Peck, Board compensation analyst. "If inflation nudges up, however, as projected by The Conference Board's Economic Forum, it will be more difficult to hold the salary increase line at 5 percent."

The Conference Board is a nonprofit, non-partisan, economic research group supported by over 2700 companies, labor unions, government agencies, trade and professional organizations, libraries, colleges and universities.

**Average Salary Increase Budgets: 1988 and 1989**

| | 1988 | | Est. for 1989 | |
|---|---|---|---|---|
| Type of Business | No. of Co.'s | Median | No. of Co.'s | Median |
| **All Industries** | | | | |
| Nonexempt | 615 | 4.8% | 372 | 4.8% |
| Exempt | 631 | 5.0 | 377 | 5.0 |
| Executive | 584 | 5.4 | 357 | 5.3 |
| **Utilities** | | | | |
| Nonexempt | 87 | 4.2% | 47 | 4.2% |
| Exempt | 95 | 4.5 | 50 | 4.7 |
| Executive | 74 | 5.2 | 43 | 5.2 |
| **Manufacturing** | | | | |
| Nonexempt | 245 | 4.8% | 157 | 4.7% |
| Exempt | 251 | 4.8 | 160 | 4.8 |
| Executive | 237 | 5.2 | 153 | 5.1 |
| **Insurance** | | | | |
| Nonexempt | 87 | 5.7% | 48 | 5.8% |
| Exempt | 87 | 5.8 | 48 | 5.7 |
| Executive | 83 | 6.3 | 45 | 6.1 |
| **Commercial Banking** | | | | |
| Nonexempt | 94 | 5.0% | 53 | 4.8% |
| Exempt | 94 | 5.0 | 52 | 5.0 |
| Executive | 90 | 5.3 | 51 | 5.3 |
| **Trade** | | | | |
| Nonexempt | 31 | 5.0% | 20 | 4.8% |
| Exempt | 31 | 5.0 | 20 | 4.9 |
| Executive | 31 | 5.3 | 19 | 5.0 |

*Other industry groups are included in totals but not shown separately because of small samples.

Source: The Conference Board, May 1988 Salary Survey

# Electroswitch acquires Westinghouse line

WEYMOUTH, MA—Electroswitch acquired the Type W, WL, W-2 and WL-2 instrument and control switch product line from Westinghouse Electric Corp. in July.

Transfer of all manufacturing and marketing functions from the Westinghouse facility at London, KY, should be completed by the end of August.

An Electroswitch representative said the line is a logical extension of the firm's existing power rotary switch and auxiliary relay lines.

Electroswitch is a major supplier of rotary switches and control devices for the electrical utility, industrial and military markets and has been in business for over 42 years.

# Canada power sales may grow by acid rain rules, says AEP

COLUMBUS, OH—Canada, a strong supporter of stringent U.S. acid rain rules, would benefit by selling much more electricity to the United States if Congress passes such legislation, according to an American Electric Power official.

"If acid-rain legislation is enacted, the cost of coal-fired electricity in this country would be increased somewhere between 15 and 20 percent," said A. Joseph Dowd, senior vice president and general counsel of AEP.

### Concern could be genuine

"I am not suggesting that their concerns about acid rain are not genuine. But the Canadians are well aware that by forcing further environmental controls on U.S. industry, they are going to be able to sell an awful lot more electricity to the United States."

Dowd made the comments for NBC's "Today Show."

AEP says Canada-to-U.S. electric sales have increased 81 percent in the past seven years, amounting to $1.5 billion (Canadian) in 1987. Canada is a major supplier to the State of New York, the Northeast and the Northwest, and is actively pursuing Midwestern markets, AEP claimed.

### Keep that in mind

Strong acid-rain rules would mean that "Our plants would be shut down (due to a lack of market for their power) and, in many cases, the coal mines would be closed," Dowd contended. "I hope that the people who are watching in Washington keep that in mind."

Dowd told *EL&P* that with coal representing 87-percent of AEP's system-wide fuel mix, the company would be the utility hurt most by stringent acid-rain legislation. And Ohio Power has nearly 100-percent coal-fired capacity. In addition, AEP plants use primarily higher-sulfur coal available from Midwestern mines, Dowd explained.

### Already an effort

He said 146 emission scrubbers are in operation and another 44 are under construction or planned on U.S. generating plants, but none are operating or being built on Canadian power plants.

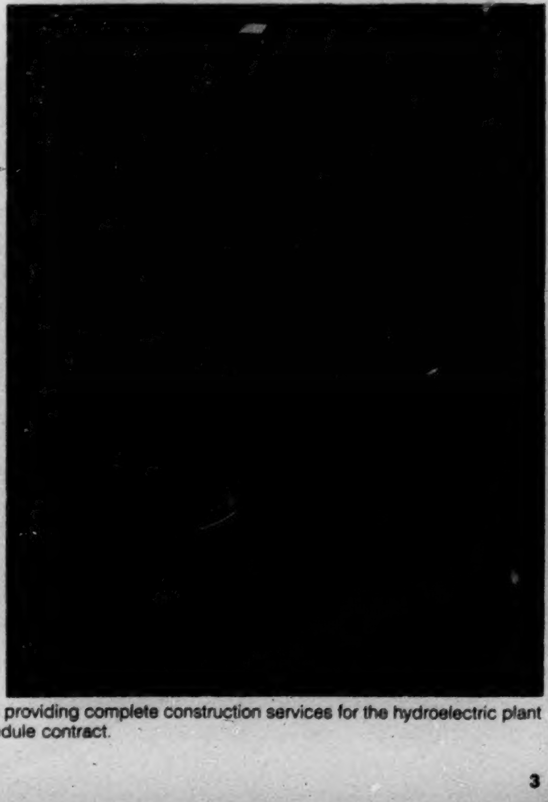
Dowd said no scientific evidence shows that Midwestern industries and power plants cause higher acid levels in the lakes of the Northeast and Canada.

### Current legislation

"Of the legislation in Congress now," Dowd said, "the Mitchell bill is the most extreme. If that passes, we would forecast rate increases approaching 20 percent on the average, with industrial rate increases near 30 percent."

SB 1894, sponsored by Sen. George J. Mitchell (D-ME), was passed out of committee last fall and awaits discussion on the Senate floor. Other, less-comprehensive proposals are still in committee. AEP's Carl W. Crawford said with the current session drawing to a close for the presidential conventions, immediate action is unlikely.

# *Hydro station is largest run-of-river*



When it is finished, Dominion Capital Inc. and Catalyst Energy each will own 50 percent of the largest hydroelectric project currently under construction in the United States. The eight turbines (three of which are shown being built in a shipyard near New Orleans) will generate 192 MW in 1990. They will be installed next to the Mississippi River, 45 miles south of Vidalia, and 100 miles northwest of New Orleans. When completed, the powerhouse structure will be barged up the Mississippi (river levels and government dredging operations willing) to the Sidney A. Murray Jr. Hydroelectric Station. Electricity generated at the station will be sold under a 43-year, fixed-price agreement to the town of Vidalia and Lousiana Power & Light Co., a subsidiary of Middle South Utilities Inc. Construction is more than 25-percent complete, including dredging operations by the contractor at the site to make a channel for water to flow from the river through the plant. Dominion Capital is the investment subsidiary of Dominion Resources Inc. Ebasco Contractors Inc. is providing complete construction services for the hydroelectric plant under a fixed-price, fixed-schedule contract.

# COMMENTARY

## Power imports, U.S.-Canada trade pact are no panacea for utilities' problems

**Canadian electricity is making life more comfortable for New England and northern-tier state electric industry leaders. It offers the potential of low-priced energy for capacity-tight U.S. markets, based on low-cost hydro-generation. But if consumers on this side of the border believe that Canadian power is more than a temporary solution to local and regional power supply problems, they ought to rethink the situation.**

**The U.S.-Canada trade pact will smooth trade between our two countries in many areas. But for electric utilities, the effect will be minimal. U.S. and Canadian utility executives will continue to negotiate contracts for U.S. utilities to buy Canadian electricity, and for Canadian utilities to sell their surplus electricity to American utilities, just as they have been doing.**

**Consumers and environmentalists south of the border see only good things resulting from the treaty, insofar as electricity is involved. They read and hear that most of the power being imported into the U.S. is low-cost hydroelectricity from plants completed in lower-cost construction days. They see no adverse impact on *their* environment, no land going for power plant construction, no pollution of the local skies or streams. No new plant construction by their local utility that could raise rates. It's almost like winning a piece of the lottery, without even risking the price of a ticket. Even regulators have jumped on the bandwagon.**

**But there is a flip side to the low-cost Canadian power deal. As Canadian Energy Minister Marcel Masse says, "the Agreement does not establish a continental energy policy." What this means is that U.S. utilities have no *right* to Canadian electricity. Canadian power will be made available to U.S. utilities so long as it is economically advantageous for Canadian utilities to offer it and so long as there is no domestic Canadian need for the power. So long as Canadian power is priced even minutely below U.S. utilities' real avoided cost for new capacity, Canadian utilities will be able to sell as much electricty to their American cousins as they desire at *their price*.**

**But the *ease* and *instant economy* offered by access to the Canadian power supply can be a real business soporific. They can lead to over-dependence and long-term problems. The greater the dependence of any individual utility on Canadian power, the less incentive there will be for that utility to build new capacity to serve its own growing customer demand. Besides, since customer growth tends to come in small increments, exercising options to buy a bit more Canadian power is an easy, economic decision, and one that won't rile regulators.**

**Canadian negotiators have a way of appearing to *lose* gracefully to U.S. negotiators, then walking away with most of the marbles. In past negotiations, take the Columbia River Treaty for example, that's why we seem to get what we want...but then end up paying the Canadians to build dams and other power facilities that will benefit them as much or more than they will U.S. interests.**

**Don't get me wrong. I like the Canadians. My wife came from there. And I respect them...for their honesty, openness, sense of fair play, their work ethic and business acumen, and for their sense of national purpose. Canadian power imports, in the short- to mid-term, can be good for both the U.S. and Canada. But customers of northern-tier state utilities looking northward for mid-to long-term solutions to their power-supply needs could become victims of treaty naivete.**

*Robert A. Lincicome, Editor-in-Chief*

## UI, ESCO sign sale/leaseback agreement

NEW HAVEN, CT—United Illuminating Co. received $12 million in a sale/leaseback agreement with ESCO Inc. for six fuel-oil storage tanks in New Haven and Bridgeport, CT.

ESCO, based in Connecticut, will spend $1.6 million to repair two of the tanks and employ UI to do the repairs. The deal is expected to save customers $1 million a year through a fuel-adjustment clause.

UI will be able to purchase oil in tanker loads at lower prices than in barge loads, which is now the practice. The agreement, approved by state regulators in late April, is similar to a collateralized loan.

UI said it plans to repurchase the tanks for a nominal sum at the end of the seven-year leaseback term.

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# LETTERS

### Status of COTP

On behalf of the Transmission Agency of Northern California, I want to clarify the status of the California-Oregon Transmission Project (COTP). The COTP is a proposal by nearly all the public and investor-owned utilities in California to build a 500-kV transmission line from Southern California to the San Francisco Bay area, adding 1600 MW of transfer capacity between the two regions. This new path for electricity will enable utilities in California and the Pacific Northwest to diversify power resources and provide more reliable and economical service to their electric customers.

The COTP was the subject of an article in the April issue of *EL&P*. The article informed your readers that the California Public Utilities Commission had rejected applications for Certificates of Public Convenience and Necessity for three investor-owned utilities to construct and operate the project. The story failed to mention that those three are not alone in planning to build the line.

In 1983, a group of California municipal utilities began actively studying construction of a new transmission line to the Northwest. Recognizing the importance of the COTP to their communities and to the overall regional transmission system, 15 publicly owned utilities proposed development of the COTP. This union of publicly owned agencies became the Transmission Agency of Northern California or TANC, a joint powers agency under the laws of California.

TANC is playing a major role in the planning and development of the COTP. It serves as project manager and lead agency under the California Environmental Quality Act. TANC will have the largest share of the project's capacity. The Western Area Power Administration is the lead agency under the National Environmental Policy Act.

Since the COTP was initiated, there has been considerable progress in making the project a reality. TANC and [WAPA] have completed and approved a combined Environmental Impact Statement/Report on the project. In addition to the decisions by [WAPA] and TANC, several other steps toward development of the COTP are planned—including decisions by the CPUC on participation by investor-owned utilities.

The project participants are currently working to continue development of the COTP on-schedule in spite of the difficulties faced by our investor-owned utility partners. The present plan calls for the completion of the COTP in the 1991-1992 time-frame.

In short, the COTP is alive and well and on-schedule, a message that might not be taken from your article.

*Laura Edlin*
*Public Affairs Director*
*Calif.-Oregon Transmission Project*
*Sacremento, CA*

### What's so rare?

From your appeal for assistance in finding an engineering journalist it is obvious that your heart is in *EL&P* and its justification for the future.

You say,"So what's so rare?" And on this you are finding the message loud and clear: An engineering journalist similar to your own competence and perspective, or with the potentialities of becoming one, is not to be found.

I have found that your journal carries some important stories and some perceptive editorials. This was demonstrated in December 1981: "Is there a nuclear future, and does anybody really care?" Today you have the answer to this in great depth, but you show no signs of understanding the cause. If you did, you wouldn't have written the last two paragraphs of that [December 1981] editorial (or you would have said "inside" instead of "outside" [the industry]).

As long as you are creating a new opportunity in engineering journalism, I hope that you will shoot very high.

*Adolph J. Ackerman*
*Consulting Engineer*
*Madison, WI*

*Editor's note: We always shoot high...If we miss the target, it isn't from not trying.*

## Lasting support likely for faster tax payback

WASHINGTON—Customers would be better off financially if electric utilities quickly repaid about $10 billion in excess deferred federal income taxes, according to a study released by the National Association of State Utility Consumer Advocates and endorsed by the National Association of Regulatory Utility Commissioners.

After the 1986 Tax Reform Act, utilities no longer owed the money collected to pay for future federal taxes at the 46 percent maximum corporate tax rate. The rate was reduced to 34 percent. Section 203(e) of the act prolongs the refund of this money by tying it to the regulatory book lives of utility assets.

NASUCA, NARUC and others support legislation, HR 1049, sponsored by Rep. Byron Dorgan (D-ND), which would repeal Section 203(e). Repeal would let state regulators decide over what period of time refunds should be paid, according to each utility's financial ability.

Sources say the legislation, still in committee, probably will not reach the house floor this session. Dorgan and supporting groups plan to reintroduce and support the measure next session.

Recent studies by Exeter Associates, a Washington, DC, utility analysis firm, and NARUC say state regulators are not likely to demand repayment in an unreasonably short time, said NASUCA.

After the 1979 cut of the maximum federal corporate tax rate from 48 percent to 46 percent, only three states required one-year refunds, NARUC noted. The Exeter study, which focused on telephone utilities, explained that a five-year refund scenario would cause just a 2-percent reduction in cash flow. Such a rate of refund still would allow funding of nearly 100 percent of its dividends and construction from internal funds.

### Consider electric utilities carefully

NASUCA's Daniel Clearfield said that state regulators would have to consider electric companies' refunds more carefully. Some electric utilities, unlike relatively strong telephone companies, have not fully recovered from massive construction programs, Clearfield pointed out.

David M. Barasch, NASUCA president, noted that "HR 1049 will provide state utility commissions with the flexibility and discretion to implement refund schedules appropriate to local circumstances."

Other groups supporting the legislation include American Public Power Association, Consumer Federation of America, Citizens for Tax Justice, and Environmental Action.

# The Top 100 electric utilities' 1987 operating performances

**Henry Stein**
**Engineering Editor**

BARRINGTON, IL – Electricity has become even more vital, not just in the United States, but all over this globe of ours. However, even in this country, worries are surfacing about its future reliability and affordability.

Noted Robert Scherer, chairman of the Edison Electric Institute, in the next 15 years "we will find our dependence on electricity to be even greater than it is today," and, "so much income, comfort, health and security-creating activity will depend on an uninterruptible flow of electricity."

Because of these reasons, the Electricity Futures Project, led by EEI, identified factors which will affect future demands for electricity:

(1) Residential-sector electricity usage will increase, reflecting a higher per-capita and household income, and a desire for convenience equipment in homes.

(2) The commercial sector will need more power because of growth in service and trade employment. Productivity enhancements in services will require mass data transmission, more sophisticated controls in manufacturing, computerized product design, and diagnostics equipment in the medical field.

The industrial sector will need more and higher-quality power to improve productivity, increase automation and serve more process heating.

William McCollam Jr., president of EEI, said, "While use of all forms of energy grew by 2 percent between 1973 and 1987, electricity use increased over 42 percent. Electricity generation now accounts for more than 51 percent of all the primary energy use in the U.S., excluding transportation." He added that a recent national study of residential customers showed that they want and need good reliability in their electrical supply.

### Nuclear far from dead

Nuclear power continued its slow climb into the worldwide generation field, in spite of the cutoff of planning and building of new plants in this country. The number of operating, commercial, nuclear electric plants worldwide topped the 400 mark in 1987. Of these, 109 were in the United States, according to a survey performed by the U.S. Council for Energy Awareness.

The nuclear generating capacity in the U.S. reached 97,243 MWe, going by the USCEA records. This was 18 percent of the electricity produced in this country last year. The organization also pointed out that oil, in spite of its recent price declines, continued to lose ground as a fuel of choice in electric utilities throughout the world.

And *Nuclear News* pointed out that most of this country's nuclear power plants showed steady improvement in their capacity factors during the years of 1985-1987, inclusive. The median capacity factor for operating nuclear plants was 63.3 percent for '85-'87; for '82-'84, the median was 59.5 percent.

In addition, the number of plants with capacity factors of more than 80 percent rose from four to ten, and those with factors of more than 70 percent climbed from 16 to 28.

### Summarizing this report

And what do the figures collected and analyzed by *EL&P* from the 100 largest investor-owned electric utilities' (IOUs') Uniform Statistical Reports (USRs) and other sources show, to put all this into perspective? The smaller Tables 1-5 sum up some of the overall and more pertinent numbers. The large Tables 6-9 give the results from the individual utilities that made up the Top 100 investor-owned companies in 1987 (see *EL&P*, June 1987, pp. 19-23).

Unfortunately, all the information was not sent in by all of the Top 100 companies. But, since most did cooperate fully, the tables give a good picture of the year's operations.

Summing up some overall results experienced by those Top 100, their power plants reversed the downward trend in coal usage in 1987, and oil continued its slide. Natural gas began to gain favor in the industry (See Table 1).

Seasonal peaks climbed last year by 2 percent more than the year before (see Table 2). And, of course, new peaks are currently being hit through much of the country this year (which will be reported as they occur and reflected in next year's *EL&P* operating report).

But these new, higher peaks were not matched by increases in the utilities' capacities, as was shown graphically by the drop in the overall reserve margin from 24.5 percent in 1986 to approximately 22 percent in 1987.

In point of fact, many utilities are reporting difficulty in keeping up with demand in this next, hot, dry summer of 1988. Even Commonwealth Edison, serving Chicago and Northern Illinois – reviled by its critics for overbuilding power plants, and in particular nuclear plants – recently noted that the peaks predicted by those very same critics for the year 2000 were already surpassed in 1987.

And the company-owned, overall reserve margin for the Top 100 also dropped from 16.9 percent in 1986 to only 16 percent in '87.

The Utility Data Institute's 1988 late-June figures pointed out a major part of the problem. Only two new, electric-utility-owned, coal-fired, power plants were finished and started operating this year so far. This was the smallest number since utilities began building coal-fired plants to produce baseload electricity for the national grid early in the century. And a total of only four new plants are planned for completion in 1989, two in 1990, three in 1991, and two in 1992, according to UDI.

**TABLE 1.**
**FOSSIL FUEL CONSUMPTION**

| | 1986 | Change | 1987 | Change |
|---|---|---|---|---|
| Coal (million tons) | 505 | −1.5% | 933 | +45.9% |
| Oil (million bbl) | 185 | +25.7% | 171 | −15.7% |
| Gas (billion cu ft) | 2,077 | −15.5% | 2,176 | +4.5% |

**TABLE 2.**
**PEAK DEMAND AND RESERVE MARGINS**

| | 1986 | Change | 1987 | Change |
|---|---|---|---|---|
| Seasonal Peak (MW) | 395,347 | +0.5% | 379,475 | −3.0% |
| Total System Capability (MW) | 492,253 | +2.3% | 461,573 | −6.6% |
| System Reserve Margin | 24.5% | | 22% | |
| Total Owned Capability (MW) | 462,300 | +0.2% | 439,890 | −5.1% |
| Owned Reserve Margin | 16.9% | | 16% | |
| Average Load Factor | 56.0 | | 57.1 | |

**TABLE 3.**
**TYPE OF GENERATION (MW)**

| Type | 1986 | Change | 1987 | Change |
|---|---|---|---|---|
| Conventional Steam & Combined Cycle | 341,382 | −0.3% | 330,201 | −3.4% |
| Hydro & Pumped Storage | 23,326 | 0.9% | 22,622 | −3.1% |
| Gas Turbines & Internal Combustion | 33,468 | −0.8% | 34,729 | +3.8% |
| Nuclear | 84,572 | 14.1% | 87,134 | +3.7% |
| Total | 482,848 | 1.5% | 454,686 | −1.8% |

Meanwhile, there will be no new nuclear power plants after the mid-1990s. During that time period, the last new nuclear plants will either enter commercial service or have been abandoned, mainly due to political reasons.

### Spending plans

A survey by *Power Engineering* magazine, found that utility spending plans look strong for the next three years. But most of the money will go to plant-modification and life-extension projects. Only 27 percent of company outlays currently are earmarked for new generating capacity.

Breaking out that amount from the approximately $3 billion involved leaves $810 million available to build this new capacity. In addition, an extrapolation of spending trends by the magazine led to the conclusion that the overall capacity factor for the utilities in this country can be expected to continue dropping at least through 1995.

As mentioned previously, the increase in generating capacity was not enough to keep up with the jump in usage in '87 (see Table 3). In steam generation capacity, still, of course, the major source of electric energy in the United States, a slight *drop* was seen in available generating power.

### Thermal efficiencies

As might be expected with a sample of this size, overall heat rate changed very little compared to the year before. The median heat rate in 1986 was 10,610 Btu/kWh, and it was 10,564 in 1987.

But these numbers *are* significant when previous years are taken into account. The median thermal efficiency fell slightly in 1986 for the first time in five years, as shown by the increased heat rate. But then last year, efficiency improved again. Utilities must be doing something right.

For comparison, here are some figures on median heat rates for preceding years: in 1985, the median heat rate was 10,605 Btu/kWh; the heat rate was 10,616 in 1984; it was 10,650 in 1983; and 10,790 in 1982.

A newcomer to *EL&P*'s Top 100 leaped into the number one position in the heat-rate table as the most thermally efficient IOU in the country—Green Mountain Power of Vermont, with a rate of 9770 Btu/kWh. Green Mountain broke Commonwealth Energy's three-year stint as the record-holder.

American Electric Power moved up into the No. 3 slot from No. 5 in 1986. Southwestern Public Service moved from No. 7 to No. 4, and United Illuminating went from eighth to fifth.

## Unit heat rates

Notice how the utilities which have the top overall heat rates also appear and reappear among the listings for operating the most-efficient, individual, generating units using fossil fuels (Table 4) and in those of the best, overall, baseload, fossil-fueled boilers (Table 5).

American Electric Power is No. 3 in the overall list and had the best individual unit (among utilities with high capacity factors) in Sporn Unit 5, with a heat rate of 8821. The company followed up in the Nos. 8 and 9 places for efficient individual units. Detroit Edison had the second-most efficient unit with Trenton Channel Unit 9, while being No. 15 in the overall table. Commonwealth Energy was No. 2 in overall heat rate and No. 3 with its Canal-1 unit. And then there is Duke Power, No. 14 in the overall-system list, but holding down spots number 4, 5, 6, 7 and 11 for individual units.

## New to the list

New to this list, Atlantic Energy took

### TABLE 4.
### TOP GENERATING UNITS BY HEAT RATE
### (capac. factor > 50%)

| Rank & Unit | Capacity (MW) | Utility | Heat Rate (Btu/kWh) |
|---|---|---|---|
| 1. Sporn-5 | 450 | American Electric Power | 8,821 |
| 2. Trenton Channel-9 | 500 | Detroit Edison | 9,040 |
| 3. Canal-1 | 572 | Commonwealth Energy | 9,048 |
| 4. Belews Creek-2 | 1,120 | Duke Power | 9,051 |
| 5. Marshall-4 | 660 | Duke Power | 9,053 |
| 6. Marshall-3 | 660 | Duke Power | 9,103 |
| 7. Belews Creek-1 | 1,120 | Duke Power | 9,142 |
| 8. Sporn-2 | 150 | American Electric Power | 9,214 |
| 9. Amos-2 | 800 | American Electric Power | 9,236 |
| 10. BayShore-4 | 215 | Centerior Energy | 9,265 |
| 11. Marshall-1 | 385 | Duke Power | 9,269 |
| 12. Bay Shore-1 | 136 | Centerior Energy | 9,279 |
| 13. Sporn-4 | 150 | American Electric Power | 9,300 |
| 14. BayShore-3 | 142 | Centerior Energy | 9,309 |
| 15. Bowen-4 | 867 | Southern Companies | 9,313 |
| 16. Clinch River-2 | 235 | American Electric Power | 9,332 |
| 17. Marshall-2 | 385 | Duke Power | 9,345 |
| 18. Mountaineer-1 | 1,300 | American Electric Power | 9,360 |
| 19. Milliken-2 | 169 | New York State Elec. & Gas | 9,373 |
| 20. Edgewater-4 | 106 | Wisconsin Public Service | 9,374 |

| Company | Rank | Heat Rate (Btu/kWh) | Up or Down | Coal (1000 tons) | Oil (1000 bbl) | Gas (1000 MCF) | Percent Change In Coal | Oil | Gas |
|---|---|---|---|---|---|---|---|---|---|
| Green Mountain Power | 1 | 9,770 | - | 23¹ | 113 | 373 | NA | NA | NA |
| Commonwealth Energy System* | 2 | 9,809 | U | 0 | 8,218 | 4,841 | - | -16 | 445 |
| American Electric Power* | 3 | 9,865 | D | 36,073 | 0 | 5 | -9 | - | -78 |
| Southwestern Public Service | 4 | 9,894 | D | 7,202 | 3 | 75,863 | 8 | 50 | -10 |
| United Illuminating | 5 | 9,894 | D | 787 | 6,651 | 2,986 | 3 | 0 | 3111 |
| [illegible] | 6 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Allegheny Power System* | 7 | [illegible] | D | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | 8 | 9,945 | U | [illegible] | [illegible] | 111 | [illegible] | [illegible] | -44 |
| Florida Progress* (FPC) | 9 | [illegible] | U | [illegible] | [illegible] | [illegible] | [illegible] | -12 | 61 |
| [illegible] | 10 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| DPL* | 11 | 9,984 | U | 5,671 | 0 | 0 | 5 | -100 | -100 |
| Cincinnati Gas & Electric | 12 | 9,988 | U | 7,958 | 1,107 | 74 | 8 | 8415 | 19 |
| Potomac Electric Power | 13 | 9,993 | D | 6,472 | 2,576 | 6,834 | 2 | -40 | - |
| Duke Power | 14 | 10,024 | U | 8,763 | 186 | 179 | -21 | 34 | -46 |
| Detroit Edison | 15 | 10,080 | D | 19,326 | 517 | 2,389 | 21 | -62 | -52 |
| [illegible] | 16 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| TECO Energy* | 17 | 10,110 | D | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Southern Company* | 18 | 10,115 | D | 44,078 | 150 | 8,274 | 3 | -48 | -31 |
| Public Service of Indiana | 19 | 10,117 | U | [illegible] | 2 | [illegible] | [illegible] | 0 | - |
| [illegible] | 20 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Cilcorp* | 21 | 10,161 | U | 2,280 | 0 | 13 | 8 | - | -7 |
| Centerior Energy* | 22 | 10,174 | U | 2,262 | 7 | 5 | -9 | 250 | -90 |
| Central Hudson Gas & Electric | 23 | 10,270 | U | 414 | 3,585 | 6,036 | NA | -40 | 992 |
| Union Electric | 24 | 10,347 | D | 10,261 | 40 | 574 | 3 | -52 | 93 |
| Pennsylvania Power & Light | 25 | 10,368 | D | 424,343 | 7,025 | 0 | 4078 | -24 | - |
| Central & South West* | 26 | [illegible] | D | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| General Public Utilities* | 27 | 10,375 | D | 7,419 | [illegible] | [illegible] | [illegible] | -75 | [illegible] |
| Dominion Resources* | 28 | 10,382 | D | 8,937 | 4,409 | 2,500 | 9 | -9 | 777 |
| Niagara Mohawk Power | 29 | 10,412 | D | 2,805 | 7,161 | 28,675 | 14 | -88 | 27 |
| Louisville Gas & Electric | 30 | [illegible] | D | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Gulf States Utilities | 31 | 10,436 | U | 1,976 | 220 | 158,214 | -25 | -60 | -3 |
| Illinois Power | 32 | 10,446 | U | 7,379 | 10 | 446 | -5 | -89 | 11 |
| Duquesne Light | 33 | 10,449 | U | 4,561 | 64 | 205 | -5 | -10 | 28 |
| Midwest Energy* | 34 | 10,455 | U | 1,885 | 33 | 1,554 | -2 | 267 | 380 |
| Houston Industries* | 35 | 10,457 | U | 15,869 | 155 | 282,246 | 83 | 25 | -8 |
| Kentucky Utilities | 36 | [illegible] | D | [illegible] | [illegible] | [illegible] | 11 | NA | [illegible] |
| Utah Power & Light | 37 | 10,476 | D | 6,086 | 45 | 96 | [illegible] | 0 | -31 |
| Atlantic Energy* | 38 | 10,486 | D | 1,083 | 1,452 | 3,351 | [illegible] | 14 | [illegible] |
| Carolina Power & Light | 39 | 10,488 | U | 8,535 | 10 | 175 | -10 | -44 | -67 |
| Orange & Rockland Utilities | 40 | [illegible] | U | [illegible] | [illegible] | [illegible] | [illegible] | -21 | [illegible] |
| Long Island Lighting | 41 | 10,509 | D | 0 | 17,886 | 24,191 | - | 15 | -1 |
| Wisconsin Power & Light | 42 | 10,510 | U | 3,856 | 19 | 222 | 2 | -21 | 13 |
| Idaho Power | 43 | 10,512 | D | 2,883 | 0 | 4 | 124 | -100 | -30 |
| San Diego Gas & Electric | 44 | 10,523 | D | 0 | 281 | 52,591 | - | -80 | 63 |
| Baltimore Gas & Electric | 45 | 10,538 | U | 4,076 | 2,442 | 4,149 | 0 | 72 | 347 |
| Northern Indiana Public Service | 46 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Savannah Electric & Power | 47 | 10,551 | D | 792 | 150 | [illegible] | 7 | [illegible] | -27 |
| Central Maine Power | 48 | 10,559 | D | 0 | [illegible] | 0 | [illegible] | -2 | - |
| Hawaiian Electric* | 49 | 10,580 | U | 0 | 11,778 | 3 | - | 5 | - |
| IPALCO Enterprises* | 50 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Central Louisiana Electric | 51 | 10,584 | D | 1,814 | 0 | 28,835 | 358 | - | -15 |
| Central Illinois Public Service | 52 | 10,598 | D | 4,532 | 31 | 0 | -4 | 48 | - |
| Ohio Edison | 53 | 10,601 | D | 10,820 | 41 | 0 | -3 | -34 | - |
| Kansas City Power & Light | 54 | 10,619 | U | 5,983 | 66 | 124 | 10 | -20 | -43 |
| Public Service Enterprise Group* | 55 | 10,634 | D | 3,880 | 3,114 | 50,476 | 8 | -49 | 107 |
| Southern Indiana Gas & Electric | 56 | [illegible] | U | [illegible] | [illegible] | [illegible] | 1 | [illegible] | [illegible] |
| Sierra Pacific Power | 57 | 10,640 | D | 1,027 | [illegible] | [illegible] | 21 | 24 | 5 |
| Northeast Utilities* | 58 | 10,642 | D | 414 | 10,577 | [illegible] | 5 | -29 | [illegible] |
| Rochester Gas & Electric | 59 | 10,661 | D | 680 | 584 | 74 | 16 | 77 | 4 |
| El Paso Electric | 60 | [illegible] | U | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Wisconsin Public Service | 61 | 10,720 | D | 3,406 | 29 | 281 | 3 | -17 | 218 |
| Southern California Edison | 62 | 10,739 | - | 5,251 | 1,348 | 186,531 | 0 | 0 | 0 |
| Pinnacle West Capital* | 63 | 10,740 | D | 5,972 | 80 | 4,832 | 8 | 627 | -54 |
| Northern States Power | 64 | 10,741 | U | 9,491 | 90 | 2,104 | 42 | -4 | 203 |
| Middle South Utilities* | 65 | 10,792 | D | 7,510 | 206 | 166,336 | -9 | -90 | -10 |
| Delmarva Power & Light | 66 | [illegible] | U | [illegible] | [illegible] | [illegible] | 3 | -14 | [illegible] |
| Iowa Southern* | 67 | 10,797 | - | 1,290 | 43 | 0 | NA | NA | NA |
| Consolidated Edison | 68 | 10,815 | D | 0 | 18,516 | [illegible] | - | 5 | 11 |
| Pacificorp | 69 | 10,826 | D | 12,374 | 62 | 0 | 21 | -8 | - |
| Utilicorp United | 70 | 10,844 | U | 1,284 | 3 | 14 | [illegible] | [illegible] | 77 |
| Minnesota Power | 71 | 10,847 | D | 3,539 | 0 | 3 | 22 | - | 3 |
| Iowa-Illinois Gas & Electric | 72 | 10,856 | U | 2,445 | 13 | 522 | 0 | 18 | -15 |
| Philadelphia Electric | 73 | 10,867 | U | 2,990 | 5,064 | 1,382 | 23 | 13 | 69500 |
| Portland General* | 74 | 10,884 | D | 894 | 0 | 0 | 0 | -100 | - |
| Iowa Resources* | 75 | 10,891 | U | 1,843 | 14 | 526 | -10 | -39 | -153 |
| Public Service of Colorado | 76 | [illegible] | U | 6,168 | 30 | [illegible] | -4 | 3 | [illegible] |
| Washington Water Power | 77 | 10,914 | U | 1,465 | 2 | [illegible] | 34 | 5 | -67 |
| Wisconsin Energy* | 78 | 10,928 | - | 6,594 | 110 | 674 | 0 | 0 | 0 |
| Puget Sound Power & Light | 79 | 10,941 | U | 2,793 | 8 | [illegible] | 12 | 50 | 43 |
| Texas Utilities* | 80 | 10,942 | U | [illegible] | [illegible] | [illegible] | [illegible] | 219 | [illegible] |
| Entech | 81 | 10,947 | D | 3,234 | 11 | 470 | 7 | 22 | 14 |
| Nevada Power | 82 | 10,963 | D | 2,369 | 80 | 3,836 | -2 | -17 | 14 |
| Madison Gas & Electric | 83 | 10,987 | D | 789 | 4 | 519 | 16 | -50 | -45 |
| Kansas Gas & Electric | 84 | 11,010 | U | 3,165 | 0 | 5,765 | 17 | - | -20 |
| Commonwealth Edison | 85 | 11,017 | U | 12,419 | 3,162 | 324 | -9 | -23 | -91 |
| Oklahoma Gas & Electric | 86 | [illegible] | U | [illegible] | 14 | [illegible] | [illegible] | -42 | [illegible] |
| Tucson Electric Power | 87 | 11,125 | U | 1,661 | 0 | [illegible] | -4 | - | [illegible] |
| Central Vermont Public Service | 88 | 11,182 | U | 43¹ | 63 | 0 | 78 | 0 | - |
| Interstate Power | 89 | 11,201 | D | [illegible] | 9 | 915 | 1 | -25 | 16 |
| Empire District Electric | 90 | [illegible] | [illegible] | [illegible] | [illegible] | 171 | [illegible] | -46 | [illegible] |
| KPL Gas Service | 91 | 11,324 | D | 5,348 | 18 | 2,149 | -1 | 64 | 75 |
| IE Industries* | 92 | 11,369 | U | 1,080 | 22 | 316 | 6 | 47 | 51 |
| Public Service of New Mexico | 93 | 11,528 | D | 3,460 | 4 | 251 | -6 | -81 | -72 |
| Otter Tail Power | 94 | 11,709 | D | 1,019² | 3 | 0 | -43 | 0 | - |
| FPL Group* (FP&L) | 95 | 11,728 | U | 3 | 20,067 | 133,494 | 13700 | -18 | -9 |
| [illegible] | 96 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| TNP Enterprises* (Tex-New Power) | 97 | >20,000 | - | 0 | 0 | 2 | - | - | [illegible] |
| Public Service of New Hampshire | 98 | NA | NA | NA | NA | NA | NA | NA | NA |
| Pacific Gas & Electric | 99 | NA | NA | NA | NA | NA | NA | NA | NA |
| New England Electric | 100 | NA | NA | NA | NA | NA | NA | NA | NA |

¹ Wood
² Lignite only
*Holding company
NA Not Available
0 Less than 1% change (when in change columns)
- Zero amounts in both years

| Company | Season Peak (MW) | Change (%) | Winter (W) or Summer (S) | Total System Capacity at Time of Peak (MW) | Total System Reserve (%) | Owned Capacity At Peak (MW) | Owned Reserve (%) | Load Factor (%) |
|---|---|---|---|---|---|---|---|---|
| Allegheny Power System* | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| American Electric Power* | 15,651 | .3 | S | 22,340 | 43 | [illegible] | [illegible] | [illegible] |
| Atlantic Energy* | 1,609 | 8.8 | S | 1,681 | 4 | [illegible] | [illegible] | [illegible] |
| Baltimore Gas & Electric | 5,190 | 12.6 | S | 5,718 | 10 | [illegible] | [illegible] | [illegible] |
| Boston Edison | 2,477 | 9.3 | S | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Central Hudson Gas & Electric | 904 | 7.0 | S | 1,049 | [illegible] | [illegible] | [illegible] | 64.7 |
| Central Illinois Public Service | 1,632 | 6.7 | S | 2,439 | 49 | [illegible] | [illegible] | 55.2 |
| Central Louisiana Electric | 1,141 | -6.8 | S | 1,765 | 55 | 1,631 | 47 | 61.5 |
| Central Maine Power | 1,465 | 6.1 | W | 1,794 | 23 | [illegible] | [illegible] | 71.5 |
| Central Vermont Public Service | 394 | 1.5 | W | 470 | 19 | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| DPL* | 2,327 | 4.0 | S | 2,631 | 13 | 2,631 | 13 | 60.6 |
| Delmarva Power & Light | 2,084 | 13.3 | S | 2,277 | 9 | 2,277 | 9 | 57.8 |
| Detroit Edison | 8,427 | 4.7 | S | 9,030 | 7 | 9,236 | 10 | 57.4 |
| Dominion Resources* | 11,539 | 11.3 | S | 12,581 | 9 | 11,470 | -1 | 57.0 |
| Duke Power | 12,601 | 6.8 | S | 15,894 | 26 | 15,743 | 25 | 62.6 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Eastern Utilities Associates* | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| El Paso Electric | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Empire District Electric | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| FPL Group* (FP&L) | 12,394 | 2.1 | S | 11,871 | -4 | 13,394 | 8 | 59.7 |
| Florida Progress* (FPC) | 5,166 | -13.1 | S | 5,604 | 8 | 5,618 | 9 | 58.4 |
| General Public Utilities* | 7,316 | 10.7 | S | 9,606 | 31 | 7,807 | 7 | 63.4 |
| Green Mountain Power | 289 | NA | W | 340 | 17 | 155 | -46 | 62.0 |
| Gulf States Utilities | 4,991 | -1.6 | S | 6,871 | 38 | 6,621 | 33 | 64.1 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Illinois Power | 3,083 | 4.5 | S | 3,363 | 9 | 3,740 | 21 | 60.6 |
| Interstate Power | 852 | 7.3 | S | 984 | 16 | 961 | 13 | 59.4 |
| Iowa Resources* | 1,276 | 8.3 | S | 1,500 | 18 | 1,123 | -12 | 47.1 |
| Iowa Southern* | 473 | NA | S | 580 | 23 | 596 | 26 | 51.8 |
| Iowa-Illinois Gas & Electric | 1,027 | 8.1 | S | 1,346 | 31 | 1,452 | 41 | 61.9 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Kansas City Power & Light | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Kansas Gas & Electric | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Kentucky Utilities | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Louisville Gas & Electric | 1,851 | -3.2 | S | 2,370 | 28 | 2,370 | 28 | 56.8 |
| Madison Gas & Electric | 477 | 6.7 | S | 587 | 23 | 589 | 23 | 53.0 |
| Middle South Utilities* | 11,270 | -3.7 | S | 15,777 | 40 | 15,844 | 41 | 57.8 |
| Midwest Energy* | 881 | NA | S | 1,196 | 36 | 1,236 | 40 | 47.5 |
| Minnesota Power | 1,117 | 8.3 | W | 1,570 | 41 | 293 | -74 | 75.0 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| New England Electric* | NA | NA | NA | NA | NA | NA | NA | NA |
| New York State Electric & Gas | [illegible] | [illegible] | W | [illegible] | 17 | [illegible] | [illegible] | [illegible] |
| Niagara Mohawk Power | 5,780 | 1.0 | W | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Northern Indiana Public Service | 2,384 | 8.0 | S | 3,796 | 59 | N/A | -100 | 61.5 |
| Northern States Power | 6,377 | 6.1 | S | 7,335 | 15 | 6,253 | -2 | 65.4 |
| Ohio Edison | 4,579 | 7.9 | S | 5,672 | 24 | 5,306 | 16 | 65.6 |
| Oklahoma Gas & Electric | 4,630 | 0.3 | S | 6,213 | 34 | 5,772 | 25 | 40.2 |
| Orange & Rockland Utilities | 892 | 8.5 | S | 1,087 | 22 | 1,020 | 14 | 60.6 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Pacific Gas & Electric | NA | NA | NA | NA | NA | [illegible] | [illegible] | NA |
| PacifiCorp | 4,138 | 7.7 | W | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Pennsylvania Power & Light | [illegible] | [illegible] | [illegible] | 7,480 | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Pinnacle West Capital* | 3,126 | -0.8 | S | 3,997 | 28 | 3,666 | 17 | 57.4 |
| Portland General* | 2,809 | 5.6 | W | 4,248 | 51 | 2,696 | -4 | 59.6 |
| Potomac Electric Power | 5,156 | 9.6 | S | 5,575 | 8 | 5,375 | 4 | 60.9 |
| Public Service Enterprise Group* | 8,173 | 6.7 | S | 10,397 | 27 | 10,092 | 23 | 52.4 |
| Public Service of Colorado | 3,298 | 4.7 | S | 3,672 | 11 | 2,739 | -17 | 60.3 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Public Service of New Hampshire | [illegible] | [illegible] | NA | [illegible] | [illegible] | [illegible] | [illegible] | NA |
| Public Service of New Mexico | [illegible] | [illegible] | S | [illegible] | [illegible] | [illegible] | [illegible] | 71.8 |
| Puget Sound Power & Light | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| SCANA Corporation* (SCE&G) | 2,843 | 3.2 | S | 3,571 | 25 | 3,867 | 36 | 62.0 |
| San Diego Gas & Electric | 2,376 | 0.1 | W | 2,866 | 20 | 2,526 | 6 | 39.2 |
| Savannah Electric & Power | 592 | -0.5 | S | 695 | 13 | 630 | 7 | 53.6 |
| Sierra Pacific Power | 813 | 14.8 | W | 927 | 14 | 837 | 3 | 67.5 |
| Southern California Edison | 14,636 | 0.9 | S | 18,147 | 24 | 14,981 | 2 | 57.6 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Southern Indiana Gas & Electric | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Southwestern Public Service | [illegible] | [illegible] | S | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| TECO Energy* | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Texas Utilities* | 16,680 | 0.8 | S | 19,495 | 17 | 17,804 | 7 | 66.6 |
| Tucson Electric Power | 1,171 | 1.7 | S | 1,281 | 9 | 1,330 | 14 | 59.0 |
| Union Electric | 6,836 | 6.6 | S | 7,905 | 16 | 7,707 | 13 | 62.1 |
| United Illuminating | 1,072 | 8.3 | S | 1,204 | 12 | 1,233 | 15 | 57.5 |
| Utah Power & Light | 3,024 | -2.8 | S | 3,173 | 5 | 3,161 | 5 | 72.6 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Washington Water Power | [illegible] | [illegible] | W | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Wisconsin Energy* | [illegible] | [illegible] | S | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Wisconsin Power & Light | [illegible] | 11.2 | S | [illegible] | [illegible] | [illegible] | 17 | 61.5 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

NA Not Available

*Holding company

first place for best heat rates for all its fossil-fueled boilers, at 9208 Btu/kWh. Second place in this category was taken by another newcomer to the list, Baltimore Gas & Electric, with a fossil-fueled heat rate of 9291 Btu/kWh. But there comes Duke Power again in third place with a 9362. Centerior Energy and CMS Energy took Nos. 4 and 5 spots with 9648 and 9669 Btu/kWh, respectively.

## Coal usage

Coal use by the Top 100 increased by 45.9 percent in 1987 compared to 1986, to 933-million tons from 505-million tons. (Totals mentioned in this report are adjusted values that reflect the change in mix of the Top 100 companies between 1986 and 1987.)

In 1987, the top users of coal burned these amounts, in descending order of magnitude:

- Southern Co.—consumption up 3 percent this year to 44-million tons.
- American Electric Power—down 9 percent to 38-million tons.
- Texas Utilities—down 9 percent to 29-million tons.
- Detroit Edison—up 21 percent to 19.3-million.
- Allegheny Power—increased 12 percent to 16.4-million tons.
- Commonwealth Edison—decreased 9 percent to 12.4-million.
- PacifiCorp—up a whopping 21 percent to 12.4-million.
- Central & South West—down again by 9 percent to 11.8-million tons.
- Public Service of Indiana—about the same as last year, at 10.9-million.
- Ohio Edison—also down, by 3 percent, to 10.8-million tons.

## Oil use

Changes in oil prices appear to have had their effect last year on the utilities. In 1986, usage climbed by a whopping 25.7 percent. But 1987 saw an almost-as-dramatic drop of 15.7 percent. Now that prices have gone down in 1988, next year's report may show another reversal in the figures or a continued slide in oil use as utilities decide that it costs too much and is too complicated to try to keep up with the Middle-East-constructed price rollercoaster.

Utilities that had the largest changes in oil consumption between 1986 and 1987, and used more than one-million barrels during 1987 included:

- The largest percentage drop by far was recorded by Public Service Enterprise Group—down a whopping 57 percent to 2.6-million barrels.
- A close second was Eastern Utilities Associates—reduced use by 52 percent to 2.8-million barrels.
- A still-close third was Potomac Electric Power—down 45 percent to 2.4-million barrels.
- Fourth was Central Hudson Gas & Electric—down by 40 percent to 3.6-million barrels.
- Next was Niagara Mohawk Power—down 26 percent to 7.2 million barrels.

Several of the Top 100 utilities, however, bucked the trend and increased their oil use. Chief among these was:

- Baltimore Gas & Electric Co.—up by

55 percent to 2.2-million barrels of oil.
- Next was Long Island Lighting—up 15 percent to 17.9-million bbl.

But those two were pretty much alone among the large oil users in increasing their consumption by any significant amounts.

**Natural gas use**

Overall use of natural gas by the Top 100 IOUs also climbed, by 4.5 percent, according to their filings. The largest percentage increases in consumption among those using at least one-billion cubic feet in 1987 were recorded by the following companies:

- United Illuminating—their figures show a gigantic increase of 3111 percent, from a mere 93,000 cu ft in 1986 to over 2.9-million cu ft in 1987.
- Central Hudson Gas & Electric shows up again—gas usage jumped 988 percent to 6-million cu ft.
- Dominion Resources—gas use increased 741 percent to 2.5-million cu ft.

These increases were matched by large reductions in natural gas consumption by a number of other utilities such as:

- Pinnacle West Capital—down by 89 percent to 1.1-million cu ft in 1987.
- Detroit Edison—reduced by 82 percent to 2.2-million cu ft.

No individual decreases as large as the single-company increases were recorded, and the many smaller decreases did not match increases, so overall gas usage increased.

(The great percent increase by Philadelphia Electric has been left out, since the company now submits a combined report for itself and its subsidiaries.)

**Reserve capacity shrinks**

A big worry among utilities is the diminishing reserve capacity they see already and predict for the near future. The year 1982 appears to have been a watershed in this respect, with a system reserve of 29 percent.

The Top 100 increased their total system capability 2.3 percent in 1986, but only by an anemic 0.2 percent in 1987. And total system reserve margin (consisting of owned reserves and firm purchase contracts) declined from 24.5 to 22.0 percent.

Just looking at owned reserve margin showed another decrease from 16.9 percent in 1986 to 16 percent in 1987.

Average load factor climbed from 56.0

**TABLE 5.**
**TOP SYSTEM HEAT RATES, FOSSIL-FUELED BOILERS**

| | Utility | Heat Rate (Btu/kWh) |
|---|---|---|
| 1. | Atlantic Energy | 9,208 |
| 2. | Baltimore Gas & Electric | 9,291 |
| 3. | Duke Power | 9,362 |
| 4. | Centerior Energy | 9,548 |
| 5. | CMS Energy | 9,569 |
| 6. | United Illuminating | 9,578 |
| 7. | New York State Elec. & Gas | 9,597 |
| 8. | SCANA | 9,660 |
| 9. | Florida Power | 9,684 |
| 10. | Georgia Power | 9,689 |

| Company | Fossil (MW) | Fossil (%) | Fossil Last Year Change (MW) | Hydro & Pump Storage (MW) | Hydro & Pump Storage (%) | Hydro & Pump Storage Last Year Change (MW) | Diesel/Combustion (MW) | Diesel/Combustion (%) | Diesel/Combustion Last Year Change (MW) | Nuclear (MW) | Nuclear (%) | Nuclear Last Year Change (MW) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

NA Not Available *Holding company

| Company | Transmission: Below 189 kV (circuit miles) | Miles Added | 189 kV & Up (circuit miles) | Miles Added | Distribution, Overhead: Below 22 kV (pole miles) | Miles Added | 22 kV & Up (pole miles) | Miles Added | Distribution, Underground: Below 22 kV (cable miles) | Miles Added | 22 kV & Up (cable miles) | Miles Added |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Allegheny Power System* | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 1 |
| American Electric Power* | 15,761 | 5 | [illegible] | 0 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Atlantic Energy* | [illegible] | 0 | 64 | 0 | [illegible] | [illegible] | 0 | [illegible] | [illegible] | 27 | 0 | 0 |
| Baltimore Gas & Electric | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Boston Edison | NA | NA | [illegible] | 0 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Central Hudson Gas & Electric | [illegible] | 0 | 76 | 0 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 0 |
| Central Illinois Public Service | [illegible] | [illegible] | [illegible] | 0 | [illegible] | [illegible] | 0 | [illegible] | [illegible] | [illegible] | [illegible] | 0 |
| Central Louisiana Electric* | [illegible] | -1 | 312 | 14 | 0 | 0 | [illegible] | [illegible] | - | - | [illegible] | [illegible] |
| Central Maine Power | [illegible] | 0 | [illegible] | 0 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 0 |
| Central Vermont Public Service | [illegible] | -1 | 5 | 0 | 7,170 | 57 | 0 | 0 | [illegible] | 17 | 0 | 0 |
| DPL* | [illegible] | -1 | [illegible] | 0 | NA | NA | NA | NA | NA | NA | NA | NA |
| Delmarva Power & Light | [illegible] | [illegible] | [illegible] | 0 | 1,775 | 18 | [illegible] | [illegible] | [illegible] | 31 | 2,114 | [illegible] |
| Detroit Edison | 4,435 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 0 | 0 | [illegible] | [illegible] | 0 | 0 |
| Dominion Resources* | [illegible] | -73 | [illegible] | [illegible] | - | - | [illegible] | [illegible] | - | - | [illegible] | 918 |
| Duke Power | [illegible] | [illegible] | [illegible] | 0 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 2,171 | [illegible] |
| FPL Group* (FP&L) | 2,216 | 0 | 3,212 | 16 | - | - | [illegible] | 1001 | - | - | [illegible] | [illegible] |
| Florida Progress* (FPC) | [illegible] | 582 | [illegible] | [illegible] | NA | NA | NA | NA | [illegible] | [illegible] | NA | NA |
| General Public Utilities* | 4,429 | 453 | 2,122 | 254 | 40,651 | [illegible] | 8,125 | 125 | 12,701 | 610 | 1,448 | 47 |
| Green Mountain Power | 251 | NA | NA | NA | 2,214 | NA | 18 | NA | 242 | NA | 0 | NA |
| Gulf States Utilities | [illegible] | 22 | [illegible] | 1 | [illegible] | [illegible] | [illegible] | 16 | [illegible] | 17 | [illegible] | 3 |
| Illinois Power | 2,347 | -4 | [illegible] | -1 | [illegible] | [illegible] | [illegible] | 0 | [illegible] | [illegible] | 0 | 0 |
| Interstate Power | [illegible] | [illegible] | [illegible] | 720 | NA | NA | NA | NA | 548 | 14 | 0 | 0 |
| Iowa Resources* | 1,113 | 42 | [illegible] | 0 | [illegible] | [illegible] | 0 | 0 | [illegible] | [illegible] | 0 | 0 |
| Iowa Southern* | [illegible] | NA | 61 | NA | 3,147 | NA | NA | NA | NA | NA | [illegible] | NA |
| Iowa-Illinois Gas & Electric | [illegible] | -1 | [illegible] | 0 | [illegible] | 12 | 0 | 0 | [illegible] | [illegible] | 0 | 0 |
| Louisville Gas & Electric | [illegible] | 0 | [illegible] | 0 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 0 | 0 |
| Madison Gas & Electric | [illegible] | 1 | [illegible] | 0 | 1,077 | 2 | 0 | 0 | [illegible] | [illegible] | 0 | 0 |
| Middle South Utilities* | 7,146 | [illegible] | 3,073 | 495 | [illegible] | [illegible] | [illegible] | 34 | [illegible] | [illegible] | [illegible] | 47 |
| Midwest Energy* | [illegible] | NA | [illegible] | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Minnesota Power | [illegible] | 46 | [illegible] | 1 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Northern Indiana Public Service | [illegible] | [illegible] | [illegible] | 0 | [illegible] | [illegible] | 0 | 0 | [illegible] | [illegible] | 0 | 0 |
| Northern States Power | [illegible] | [illegible] | [illegible] | -1 | [illegible] | [illegible] | 0 | 0 | [illegible] | [illegible] | 0 | 0 |
| Ohio Edison | 4,911 | -41 | [illegible] | 0 | [illegible] | [illegible] | 0 | 0 | [illegible] | [illegible] | 0 | 0 |
| Oklahoma Gas & Electric | [illegible] | [illegible] | [illegible] | 0 | - | - | [illegible] | [illegible] | - | - | [illegible] | [illegible] |
| Orange & Rockland Utilities | 471 | 0 | [illegible] | 0 | [illegible] | [illegible] | 0 | 0 | [illegible] | [illegible] | 0 | 0 |
| Pinnacle West Capital* | [illegible] | 7 | [illegible] | 1 | [illegible] | [illegible] | 0 | 0 | [illegible] | [illegible] | 0 | 0 |
| Portland General* | [illegible] | 0 | [illegible] | 0 | [illegible] | [illegible] | 5 | 0 | [illegible] | [illegible] | 0 | 0 |
| Potomac Electric Power | [illegible] | 0 | [illegible] | 10 | 4,522 | [illegible] | [illegible] | 0 | [illegible] | 437 | [illegible] | 0 |
| Public Service Enterprise Group* | [illegible] | -1 | 722 | 0 | NA | NA | 47 | 0 | [illegible] | [illegible] | [illegible] | 4 |
| Public Service of Colorado | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| SCANA Corporation* (SCE&G) | [illegible] | [illegible] | [illegible] | 0 | [illegible] | [illegible] | [illegible] | [illegible] | NA | NA | NA | NA |
| San Diego Gas & Electric | [illegible] | [illegible] | [illegible] | 0 | [illegible] | [illegible] | 0 | 0 | [illegible] | 444 | 0 | 0 |
| Savannah Electric & Power | 47 | [illegible] | [illegible] | 0 | [illegible] | [illegible] | [illegible] | [illegible] | - | 0 | - | 0 |
| Sierra Pacific Power | [illegible] | [illegible] | 0 | -914 | 0 | 0 | [illegible] | [illegible] | 0 | 0 | [illegible] | [illegible] |
| Southern California Edison | [illegible] | 0 | [illegible] | [illegible] | - | - | [illegible] | 0 | [illegible] | [illegible] | [illegible] | 0 |
| Texas Utilities* | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| Tucson Electric Power | [illegible] | -3 | 1,604 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 0 |
| Union Electric | [illegible] | [illegible] | [illegible] | 0 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| United Illuminating | 91 | -15 | [illegible] | -112 | 3,041 | [illegible] | 0 | [illegible] | [illegible] | [illegible] | 2 | 0 |
| Utah Power & Light | [illegible] | [illegible] | [illegible] | 0 | - | - | [illegible] | [illegible] | - | - | [illegible] | [illegible] |

[1] Total all voltage levels [2] Wire miles [3] Pole miles [4] Cable miles [5] Line miles [6] Conduit bank miles [7] Trench miles NA Not available and/or not applicable - Miles not segregated *Holding company

to 59.6 percent during the same period.

The pattern that is emerging is the one that worries the utilities so. Yet there seems to be more and more resistance among the general public to building new power plants. This also adds to the deep concerns of the utility executives.

## Changes in generation

The world of the major utilities is changing in many ways, not the least being in the types of generation facilities they utilize. The preceding factors have combined to slow the introduction of new, large plants considerably. The total capacity of all conventional steam and combined-cycle plants actually decreased slightly from 1986 to 1987.

Hydro and pumped-storage plant capacity also went down, by a measurable 3.0 percent to 22.6 gigawatts.

As might be expected, gas-turbine and internal-combustion overall capacity rose 5.0 percent to 34.7 gigawatts. Nearing the end of the startup line, nuclear capacity for the Top 100 crept up a mere 0.8 percent to 67.1 gigawatts.

## T&D moving ahead

Transmission and distribution is where things are happening in the utility field. A total of 1842 miles of transmission lines were added in 1987 for voltages of 189 kV and up.

Overhead distribution lines for under 22 kV increased by 4637 miles.

Underground distribution lines added on over 15,000 cable miles for lines of under 22 kV, while those for 22 kV and above added more than 5,000 cable miles.

## Transmission additions

Those of the Top 100 that added the largest amount to their high-voltage transmission lines (189 kV and up) in 1987 were:

- Interstate Power—added 720 circuit miles.
- Middle South Utilities—added 495 miles.
- Southern Co.—466 miles extra.
- Dominion Resources—added on 403 miles.

Companies making the most additions to transmission lines below 189 kV included:

- Florida Progress—582 circuit miles.
- Southern Co.—537 circuit miles.
- General Public Utilities—453 miles.

## Distribution add-ons

Not to be left out, the distribution side installed quite a few new lines, too. They included, for overhead lines for 22 kV and above:

- Southern Co.—1335 pole miles added in 1987.
- FPL—1001 pole miles added.
- Oklahoma Gas & Electric—plus 888 miles.

For underground lines handling 22 kV and higher, companies added the following:

- Southern Co.—2185 cable miles.
- Dominion Resources—918 miles.
- Commonwealth Edison—883 cable miles.
- Florida Progress—790 miles.

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SEPTEMBER 1988

ELECTRIC LIGHT & POWER

EL&P

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VOICE OF THE ELECTRIC UTILITY INDUSTRY

# SDG&E asks for time

## *SCE offer throws wrench in merger plans with TEP*

**Mark T. Hoske**
**Assistant Editor**

SAN DIEGO—San Diego Gas & Electric officials have asked for an extension on Southern California Edison's merger offer on Aug. 11. At the same time, SDG&E continues to pursue its plans for merger with Tucson Electric Power Co., underway since June 13.

SDG&E asked for, and SCE Corp. granted, the extension until Sept. 1 because more time was needed to consider the offer, SDG&E said.

In their July 25 offer to SDG&E, SCE officials said they would not attempt an acquisition other than in a transaction approved by the SDG&E board of directors. The offer was conditioned on termination of merger activity with TEP (*EL&P*, July, p.15).

### An irresistable offer?

On Aug. 8, SCE Corp. Chairman and Chief Executive Officer Howard P. Allen

Continued on page 12

## LATE NEWS

**SDG&E announced Aug. 19** that SCE Corp. sweetened its offer by increasing the exchange ratio of common stock from 1.15 to 1.20. That increases the total value of the offer from about $2.19 B to $2.28 B. SDG&E is still studying the proposal. See story below.

**NRC staff fined** Philadelphia Electric Co. and 33 operators a record $1.25 million for violations at Peach Bottom. See p.4.

**The summer's third record** for electric output was set the week of Aug. 6 when U.S. utilities hit 65,424 GWh. EEI said output topped the previous record set July 16. See below and p.2.

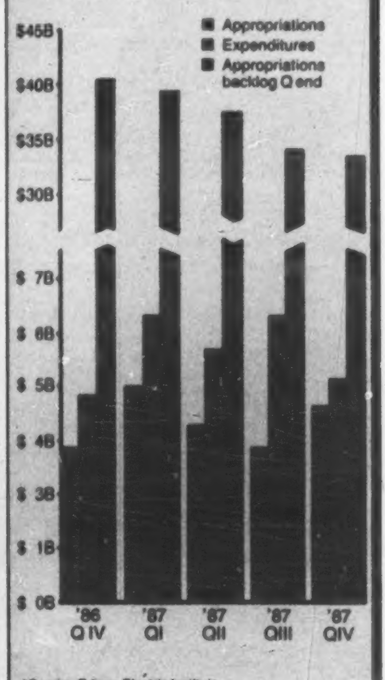
**Massachusetts' supreme** court ruled 3-2 that voters may decide in November if the state's two nuclear plants should continue operation. It questioned if closing Boston Edison's Pilgrim and Yankee—owned by 10 NE utilities—would be seizure of private property without compensation.

**PacifiCorp and Utah P&L** have extended their merger agreement through October to allow FERC time to rule on the action.

## *CAPITAL APPROPRIATIONS & EXPENDITURES*

**Investor-Owned Electric Utilities**

**The long-awaited upturn in utility construction activity could be just ahead, according to The Conference Board. Appropriations hit $4.6 Billion in the last quarter of 1987, up 18.4% from the third quarter and 19.5% ahead of the fourth quarter of 1986. The Board says it expects continuing improvements in capital appropriations in 1988.**



*Source: Edison Electric Institute
The Conference Board

# Heat sets record peaks, but drought drains capacity

**Henry Stein**
**Engineering Editor**

BARRINGTON, IL—Electric utilities have been staggered by the onslaught of the combination of the summer's heat and drought this year. And it was a tough combination to fight.

A new record was set in early August for weekly electric output due to the record-setting heat in many parts of the country. But this record output,—the third of the spring and summer—was even more of a problem for many utilities because of the drought, which was also blamed on the extremely hot weather.

### Northeast

Summer electric demand in New England soared to a new, all-time record on the afternoon of Aug.3. According to the New England Electric Power Pool, 19,220 MW were used between 2:00 and 3:00 pm. This was close to the area's record high of 19,277 MW set on Jan. 14. And it surpassed last summer's record peak of 18,058 MW.

In Massachusetts, New York and Rhode Island, voltage had to be cut by 5 percent on Aug. 4 because of high demand. Many industrial firms and private consumers on interruptible contracts saw their power supplies reduced as a consequence.

Niagara Mohawk Power Corp. began rolling blackouts on Aug. 10 due to a 400-MW shortage during peak periods.

### Midwest

In Illinois, Commonwealth Edison Co. cut off 98 of its largest industrial customers on Aug. 3 to reduce its load by 300 MW to 16,690 MW. The utility's biggest customer, Northwestern Steel & Wire Co., watched helplessly as its scrap steel ovens cooled down from a working 3050°F to a useless 1000°F. The decision to activate the interruptible contract clause was made after the utility's peak hit 17,017 MW on the day before.

One of CECo's problems was its Dresden nuclear plant. Units II and III were operating at only half their capacities in order to maintain environmentally safe temperature levels in the plant's cooling-water lake.

Another was its Braidwood Station nuclear plant. The 2540-acre lake used for the plant's cooling water had dropped from 7½-ft deep to only 6 ft. The plant's pumps had to be moved lower in the lake, but then they were nearly exposed in their new locations during another high-heat period. CECo estimated that unless the rains came or the heat let up, power production at that

Continued on page 12

# Basin tops SCE's Great Plains bid on coal/gas plant

WASHINGTON—Basin Electric Power Cooperative was selected as the preferred buyer for the Great Plains Coal Gasification Plant. Announcement of the decision was made by Energy Secretary John S. Herrington on Aug. 5. The deal could be worth $1.8 billion to the government over the next 21 years.

Basin, a consumer-owned regional G&T cooperative based at Bismarck, ND, offered the best combination of value to the government and assurance of continued operation for the plant, said the Department of Energy.

One of nine prospective purchasers, Basin owns a coal-fired power plant adjacent to Great Plains and shares coal and water supplies with the synthetic fuel project.

The co-op was chosen over two other offers—Mission First Financial (MFF), a subsidiary of Southern California Edison, and the Coastal Corp.,

Continued on page 19

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BETHESDA MD 20814

## *All Edison units now on-line & synced*

In the high heat of July, it was nice for some people to know that all 12 Commonwealth Edison Co. nuclear generating units were, for the first time, providing electric power to the company's 3-million customers. Braidwood Unit 2 (the 2240-MW Braidwood Station is shown), CECO's last nuclear unit to be built, received its full-power operating license from the NRC on May 20 and was synchronized to the company's Northern Illinois electricity grid on May 26. On July 8, LaSalle County Unit 1 returned to service from a scheduled refueling outage, and all 12 units were generating power simultaneously for the first time. No more refueling outages were planned until September, after the normal period for annual peak demand. Through May 31, 78 percent of CECO's output came from nuclear power using uranium fuel. Coal provided most of the rest of the company's electrical output. (See page 33 for details about the rate negotiations involving Braidwood Units 1 and 2, and for Byron Unit 2.)

# NEWS BRIEFS

JILL MINNER, Assistant Editor

## Early record output hit

According to the Edison Electric Institute, a new record for total U.S. weekly electric output was reached in June. Approximately 61,424 GWh were produced for the week ending June 25, a record which EEI attributes to both the early summer heat wave and steady economic growth. Usually, record outputs are not generated until July or August. EEI figures also show that total year-to-date output is up 4.3 percent over a year ago.

In other heat wave-related news, Kansas Gas & Electric Co. reported reaching a new peak demand in mid-July. The 1,646-MW peak forced the utility to use coal, nuclear, oil and gas to fuel its generating stations.

Northern Indiana Public Service said its control area load hit 2,523-MW in mid-July and that its electric system was operating well under the conditions.

The Southwestern Power Administration is adjusting its use of hydroelectric power generation to conserve water because of the drought condition prevailing over much of the United States. The hydroelectric projects will be needed to meet rising electrical demands resulting from this summer's heat wave, according to the administration.

Commonwealth Edison Co. said it needed to bring all 12 of its nuclear generating units on-line in order to meet customer demand during a yellow alert in July. The yellow alert indicates record high levels for air pollution and electricity demand, according to the utility.

## H-Q, Central Maine ink power sales agreement

Central Maine Power Co. has signed a contract to purchase a minimum of 300 MW of power from Hydro-Quebec, beginning with a 100-MW block in 1992. Under the terms of the agreement, various options could increase the contract purchase to 600 MW, if necessary. In addition, Central Maine said it would be allowed to take 800 to 1,000 MW if resale opportunities develop. The proposed sale is awaiting review and approval by the Maine Public Utilities Commission. A decision by the commission is due by January 1989, according to the utility.

## September conference to cover new electricity pricing techniques

The Electric Power Research Institute and Niagara Mohawk Power Corp. will sponsor a conference on "New Dimensions in Pricing Electricity" on September 28-30 in Syracuse, NY. The conference will focus on trends in creative packaging of electricity products and services, and the implications pricing has on DSM, economic development, industry deregulation, utility profitability, customer rate structures and the future of the industry in general. Industrial, commercial and residential pricing strategies will also be discussed. For more information write "New Dimensions in Pricing Electricity", Eric Mower and Associates, 101 S. Salina St., Syracuse, NY 13202. Or call Christopher C. Finkle, Niagara Mohawk, (315) 428-3341.

## Pacific Nuclear Systems announces its intent to buy Nutech

Pacific Nuclear Systems, Inc. has signed a letter of intent to acquire Nutech in a cash merger for approximately $10 million, according to Pacific Nuclear. Nutech is a privately owned engineering company, headquartered in San Jose, CA, which provides specialized products and services to nuclear utilities.

## CP National to sell its Oregon electric utilities

CP National Corp. said it has agreed in principle to sell its Oregon electric utilities to Oregon Trail Electric Consumers' Cooperative, according to *The Wall Street Journal*. The company expects the proposed sale, valued at $41.5 million, to close Oct. 1.

## Dominion Energy buys half of Enron Cogen

Dominion Energy, Inc. has purchased one-half of Enron Cogeneration Co. for $104.1 million in cash, according to Enron. Enron Cogeneration, a developer, owner and operator in the cogen industry, said it has ownership positions in four projects: a 450-MW plant in Texas City, TX; a 377-MW Pasadena, TX plant; a 300-MW Bayport, TX plant; and a 165-MW Bayonne, NJ project. According to the firm's parent company, Enron Corp., proceeds of the sale will be used in Enron's debt-reduction program.

## S&C Electric mgmt. changes announced

S&C Electric President John R. Conrad was recently named chairman and CEO. John W. Estey, executive vice president, will take over as president of the company. Conrad joined S&C Electric in 1945 and has served as president since 1952. In addition to his new appointment, Estey is chairman and CEO of S&C Electric Canada Ltd. where William H. Lowry was named president.

## Utilities to help develop conservation programs

Six Massachusetts utilities, two state agencies and a number of environmental groups have signed an agreement for a collaborative energy conservation and load management (CL&M) program design effort. Boston Edison Co., a participant in the effort, said the groups plan to develop cost-effective CL&M programs for residential, commercial and industrial sectors. The programs would be submitted to the Massachusetts Department of Public Utilities for approval. "This program has the potential to be a win-win situation for consumers and utilities," stated Boston Edison Chairman and CEO Stephen J. Sweeney. Inefficient lighting, heating, cooling and industrial equipment will be targeted in the program, according to the utility. The effort will also include cost-effectiveness tests and guidelines for cost recovery, accounting and rate treatment of utility investments in conservation programs. Other utilities involved are: Commonwealth Electric Co.; Eastern Edison Co.; Fitchburg Gas and Electric Light Co.; Nantucket Electric Co.; and Western Massachusetts Electric Co.

## Boston Edison's RFP program wins award

Boston Edison Co. recently received a Special Recognition Award from the Cogeneration Institute for implementing its Request for Proposals (RFP) program. According to the utility, its program promotes the use of new alternative sources of low-cost power by requesting bids from developers of cogeneration and small power production facilities. "The RFP program gives us the flexibility of a diversified resource plan and helps Boston Edison meet the future energy needs of customers," stated Richard Hahn, vice president of energy planning for the utility. Boston Edison said its first RFP, issued in 1987, consists of nine developers scheduled to supply 344 MW by 1992. The company is now awaiting approval of its second RFP, which would provide 400 MW by 2005.

## Salt River Project named 'Communicator of the Year' by PUCA

The Public Utilities Communicators Association (PUCA) presented its 'Communicator of the Year' award to Salt River Project at PUCA's annual meeting in Dallas. Awards of excellence went to Northern States Power Co., Wisconsin Power & Light Co. and Gulf Power Company. PUCA said its competition has 25 classifications which cover all phases of advertising and public relations.

## EEI honors utilities for consumer programs

The United Illuminating Co. received Edison Electric Institute's Common Goals Award for its "outstanding consumer program", according to EEI. Florida Power & Light Co. and Pacific Gas & Electric Co. also received honors for their consumer programs. UI's *SCAT 33-500 Low Income Weatherization* program approached low-income weatherization by trying to achieve a 33-percent savings on energy bills for 500 low-income households in the New Haven metro area. FP&L's *Quality Senior Living* and *Consumer Advisory Board* programs won in the public participation and community responsibility categories respectively. Also honored in the community responsibility category was PG&E's *Partnerships Program*.

## Consumer advocacy group awarded payment for role in PUC decision

The California Public Utilities Commission has ordered three California utilities to pay the Natural Resources Defense Council (NRDC) approximately $14,000 for its contribution to a recent PUC decision on revising rate setting procedures. Pacific Gas and Electric Co., Southern California Edison Co. and San Diego Gas and Electric Co. must each pay the consumer advocacy group $4668, according to the commission. During the hearings, NRDC said that although ratepayers might have to pay higher rates in order to keep large industrial users from leaving their systems, the utilities can offer the ratepayers reduced rates under special contracts. NRDC also recommended that large industrial users control costs by reducing energy use through conservation and land management measures.

## NEES committee to seek president, CEO

New England Electric System Chairman Joan Bok has temporarily taken on the additional responsibilities of president and CEO, after Samuel Huntington was struck and killed by lightning in Aspen, CO. Huntington, 49, had served as head of the utility since July 1984. According to a NEES representative, a committee has been formed to find a replacement for Huntington. No deadline has been set for the search, which is being conducted both within and outside the company.

## PacifiCorp chairman announces retirement

PacifiCorp Chairman and CEO Don C. Frisbee announced that he will retire from day-to-day operations on Jan. 1, but will remain as chairman of the board. PacifiCorp President Al M. Gleason will succeed Frisbee as chief executive officer, according to the company.

## Smith named president of Riley Consolidated

Riley Consolidated, Inc. announced the appointment of H. Kerner Smith to president of the company. Smith has held a number of positions at Babcock & Wilcox and most recently served as vice president of marketing for Riley's power generation group.

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**EL&P readers whose responsibilities include both Generation and Transmission/Distribution receive both technology sections. Other readers receive the technology section that applies to their respective area of responsibility. The Generation edition is indicated by a single dot (·) in the upper right corner of page 1; the T/D edition carries two dots (··). All readers receive EL&P's industry news section.**

# Utility financings fell 11% during first half of 1988

NEW YORK—Financings by investor-owned utilities of all types fell 11 percent, to $10.1-billion in the first six months of 1988, compared to the same period of 1987, according to Ebasco Business Consulting Co. Financings by electric companies were off 4 percent from the year earlier, to $8.2-billion.

### New money

Ebasco reported that refundings totalled $2.8 billion through June 30 this year, compared to $4.7 billion in 1987, a decline of 40 percent. New money financings rose 9 percent, to $7.2 billion.

### Long-term debt

Long-term debt issued by all utilities totalled $9.3 billion, up just 0.2 percent from a year earlier. Of the total $10.1 billion financed in the first half of the year, 68 percent was sold through negotiated sales, 22 percent was sold at competitive bidding and 10 percent was sold privately. Refunding accounted for 28 percent of total financings.

### Electric company financings

While electric companies' total financings fell 4 percent, utilities' long-term debt increased 8 percent to $7.6 billion. New financings increased 26 percent, to $5.7 billion.

Ebasco also has begun monitoring financing of cogeneration and small power plants.

For the first half, financings of alternative generation projects were: cogen—$1.7 billion; hydro—$119 million; wood—$314 million; geothermal—$219 million; and solid waste—$86 million.

**INVESTOR-OWNED UTILITY SECURITY OFFERINGS**
**($000 — 1988 vs 1987)**

**JANUARY 1 TO JUNE 30, 1988**

| | TOAL | % CHANGE | ELECTRIC | % CHANGE | GAS | % CHANGE | TELEPHONE | % CHANGE | WATER | % CHANGE |
|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL FINANCING | 10,063,080 | (11) | 8,210,097 | (4) | 1,752,983 | (26) | 100,000 | (74) | 0 | 0 |
| LONG-TERM DEBT | 9,333,142 | 0.2 | 7,565,947 | 8 | 1,667,195 | (14) | 100,000 | (74) | 0 | 0 |
| PREFERRED STOCK | 472,500 | (74) | 472,500 | (66) | 0 | (100) | 0 | 0 | 0 | 0 |
| COMMON STOCK | 257,438 | 3 | 171,650 | (18) | 85,788 | 145 | 0 | 0 | 0 | (100) |
| BY TYPE OF SALE | | | | | | | | | | |
| PUBLIC | 9,105,080 | (10) | 7,432,097 | (11) | 1,672,983 | 23 | 0 | (100) | 0 | (100) |
| PRIVATE | 958,000 | (10) | 778,000 | 289 | 80,000 | (92) | 100,000 | 100 | 0 | 0 |
| BY PURPOSE OF SALE | | | | | | | | | | |
| NEW MONEY | 7,227,950 | 9 | 5,687,167 | 26 | 1,440,783 | (23) | 100,000 | (64) | 0 | (100) |
| REFUNDING | 2,835,130 | (40) | 2,522,930 | (38) | 312,200 | (35) | 0 | (100) | 0 | 0 |
| BY METHOD OF SALE | | | | | | | | | | |
| COMPETITIVE | 2,207,900 | (22) | 1,907,900 | (24) | 300,000 | 100 | 0 | 0 | 0 | 0 |
| NEGOTIATED | 6,897,180 | (6) | 5,524,197 | (6) | 1,372,983 | 1 | 0 | (100) | 0 | (100) |
| PRIVATE SALES | 958,000 | (20) | 778,000 | 289 | 80,000 | (92) | 100,000 | 100 | 0 | 0 |

Detroit Edison's Fermi II plant was shut down for two weeks starting July 23 due to packing leaks in three valves—a reactor-core isolation cooling valve, a reactor water-cleanup vessel bottom-head drain, and a reactor water-cleanup suction valve. Shutdown was made manually after the leak increased to the allowable limit of 5 gpm, the point for an Unusual Event. The 1100-MW plant was placed in cold shutdown for repair July 24, when it was decided the valve could not be fixed at low power (about 10 percent) within 12 hours. No danger to the health or safety of plant personnel or the public resulted. The Monroe, MI, plant was running at 65-percent power by Aug. 10.

# Fermi II shut for valve leaks

DETROIT—Detroit Edison's Fermi II plant was operating at 65-percent capacity Aug. 10, on its way back from a two-week shutdown in late July and early August due to packing leaks in three valves.

Although the incident was classified as an Unusual Event, it's not expected to affect the track record for the 1100-MW plant, said DE representative Martin L. Bufalini II.

The Monroe, MI, plant was placed in cold shutdown for repair of the valves July 24, when it was decided the repairs could not be made at low power within 12 hours. Other maintenance was performed as well. No danger to the health or safety of plant personnel or the public resulted.

The shutdown came during a time when four all-time demand records were set, peaking Aug. 2 at 9131 MW. DE had to meet it's needs through peaking plants and purchases from the American Electric Power system and other utilities to the south. Fermi II usually provides 11 percent of DE's capacity requirements.

### Seriousness exaggerated

"The seriousness of the shutdown has been exaggerated greatly—the plant has been operating quite well, thank you, since January," when commercial operation began, Bufalini pointed out. He added that during this summer of record peaks, Fermi II has played a critical role in meeting the area's generation needs.

Since 1986, the NRC has fined DE $825,000 for violations at Fermi II.

### NRC comments on the incident

Russ Marabito, a representative from Nuclear Regulatory Commission Region 3, said Fermi II's performance would not be affected by this shutdown. DE is making progress with improvements, he said, despite five low grades out of 13 on a performance report for April 1987 through March 1988. Another report, for Fermi II progress for the balance of the year, would probably be released in February 1989, Marabito said.

DE officials had no estimates of the outage cost as of mid-August.

# *Stable operations, rates will aid new project financing says EPRI*

PALO ALTO, CA—An EPRI study projects several years of relatively stable operating conditions and rates that will allow electric utilities to obtain external financing comparable to historical levels. That financing should support likely increases in new construction requirements through the 1990s and the 2000s.

Under minimum-case conditions, external financing requirements will be approximately $20-billion/year (in 1985 dollars), according to the Electric Power Research Institute study, "Capital Requirements for the U.S. Investor-Owned Electric Utility Industry: 1985-2005."

### Could be worse

Under more adverse conditions external financing requirements could be as high as $30 billion/year.

The study indicates that the cost of delaying construction is very sensitive to fuel price shocks. If a crisis occurs, however, fuel and capital costs deviations from the study baseline forecasts could pose problems for utility investors and ratepayers.

The predicted period of stability presents an opportunity to restore the balance sheets of utilities, as well as investor belief in the stability and predictability of regulation. As the need for new plant financing increases, the consideration of alternative regulatory schemes could help smooth the rate increases for individual utilities, the 100-page report suggests.

### Risk on reliance

Financial constraints and the level of regulatory risks often govern utility planning decisions. Since many utilities are deferring new construction for as long as possible, the result may be a significant number of major new projects in 10 to 15 years. In the meantime, increasing reliance on liquid-fueled combustion turbines to meet capacity needs could lead to higher consumer rates and greater fuel price risks, the study says.

The absence of new construction also implies smaller rate bases and less internally generated capital at a time when the industry most needs funds.

A major assumption in the study is that the present regulatory uncertainty and changes will not have a lasting effect on the ability of utilities to raise funds from capital markets on reasonable terms.

The broad level of aggregation used in the analysis limits the research findings. Although the report assumes that regulators and utilities will reach agreements, individually or regionally, utilities may experience more-severe problems than those depicted in the report, EPRI admitted.

### More information

More information on the June report, EPRI P-5830, may be obtained by calling 415/965-4081.

# *PowerGen '88 is scheduled for Orlando Dec. 6-8*

BARRINGTON, IL—PowerGen '88, a major new conference and exhibition covering fossil-fueled generation technologies, will be held in Orlando, FL, December 6-8. It is co-sponsored by *EL&P* and its sister publication, *Power Engineering.*

A tentative technical program involving more than 120 presentations has been developed by the conference's executive committee. The committee is comprised of representatives of electric utilities, consulting engineers, equipment suppliers and representatives from the two co-sponsoring PennWell Publishing Co. publications.

David I. Johnson, managing director of PowerGen '88, reports that exhibitor reservations are runing ahead of projection and that he expects more than 100 suppliers to participate.

Johnson says he anticipates the largest attendance of any power generation conference or exhibition in many years.

The conference will open with a keynote session for all attendees on Tuesday, December 6. This session will cover major issues confronting power generation engineers and managers, including: re-regulation, environmental constraints, financing, cogeneration, fuels and technological innovations.

After keynote presentations, six concurrent technical sessions will be conducted, covering:

☐ Generation market trends and opportunities
☐ New power generation technologies
☐ Plant operations and improvements
☐ Fuel and waste management
☐ Fuel technology options
☐ Plant life extension and repowering

PowerGen '88 incorporates "Coal Technology," the international coal utilization conference, which was conducted by Johnson in Houston and Pittsburgh for a number of years.

# COMMENTARY

## NRC's penalty policy takes a turn

**The Nuclear Regulatory Commission's recent levy of fines against Philadelphia Electric Co. is more than a stiffening of its policy of fines for infractions of regulations. It reflects a whole new tack aimed at making individuals, not just corporate entities, personally responsible for their own actions-in terms of adhering to NRC rules and regulations. As such, we believe it can have a salutary effect on the performance of nuclear plant operators and on observance of safe operating procedures.**

**NRC has assessed a fine of $1.25 million against Philadelphia Electric, plus an additional $21,900 against 33 reactor operators the commission has accused of personally violating mandated operating procedures at the beleagured Peach Bottom nuclear power plant.**

**The magnitude of the fine against PE—the largest ever levied against a nuclear utility by more than $400,000—is noteworthy, and even surprising. Still, it reflects a *continuation* of the commission's previous policy of fining nuclear utilities for their transgressions of NRC rules and regulations.**

**The new direction in NRC's rules enforcement can be seen in its assessment of fines against 33 individual licensed operators at Peach Bottom, the first time ever that individual personnel have been singled out to be penalized for causing or contributing to violations of NRC regulations.**

**NRC has drawn a sharp line between the way it considers inadvertent actions that violate its regulations and the type of sloppy management and conscious, flagrant disregard for operational regulations and procedures that the Peach Bottom operators demonstrated. It is one thing, NRC reasons, to accidentally hit a switch that turns off a coolant pump or deactivates a safety control subsystem. But it is something completely different to consciously take a nap, or be involved in games or personal pursuits at the sacrifice of constant vigilance in the control room. NRC ordered Peach Bottom closed in March 1987 because of rules infractions, including the fact that some of the plant's reactor operators were found to be sleeping at the controls and playing video games instead of devoting their full efforts to their jobs.**

**NRC is fining the 33 of the 36 licensed operators working, or at least present at the work site, at the time of the inspection an average of $633 each, but ranging between $500 and $1000. Three operators were judged to be so new on the job that their actions were not counted. Two of the initial 36 subsequently left the company, ten were reassigned to other jobs at Philadelphia Electric and 24 were retrained, still hold their NRC operating licenses and will work as operators when the plant is restarted. PE has said it will neither pay the operators' fines nor reimburse them.**

**Both PE and the operators could appeal their fines. They have 30 days to pay or contest the fine. In any case, the fines assessed serve to make clear to utilities and individual operators alike that NRC will no longer tolerate poor operator performance, disregard for regulated procedures, nor lack of personal responsibility. They say that individuals, not just corporations, will be held responsible for improper actions and failure to observe safety and operational regulations. The NRC action says to nuclear operations management personnel, "You can't hide or abrogate responsibility for safety or rules infractions just because the infractions were done by someone else." Joe Paquette, the new PE chairman, has called the NRC's action "tough medicine," that it "sends a clear message to the industry and control room operators."**

**Although we've always felt that positive rewards were stronger motivators and offered a greater chance of success, there are times when punitive programs are called for. This appears to be one of those times. Awareness of the problem of sleeping shiftworkers has increased over the last two to three years. PE and its employees got caught and are being fined. But many other utilities and their nuclear and fossil-fueled plant operators share a similar guilt. We find no fault in the individual fines of Peach Bottom operators. The NRC action serves notice that nothing less than totally responsible job performance will be tolerated of utilities and their plant operating staffs...everywhere.**

**It's tough to argue against this sort of reasoning.**

***Robert A. Lincicome, Editor-in-Chief***

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## Utility ordered to compete for conservation services

MADISON, WI—The Wisconsin Public Service Commission, in a landmark decision, has ordered Madison Gas & Electric Co. to open part of its conservation-service market to competition.

Under a new competitive bidding initiative, the commission says MG&E and competitors would run conservation programs at the same time for commercial, industrial and rental customers (more than five units). MG&E will continue to provide conservation services exclusively in the residential and agricultural markets.

According to WPSC Chairman Charles Thompson, "The commission expects this competition to breed innovation similar to that in non-utility businesses in a competitive marketplace."

Previous commission orders have required Wisconsin utilities to institute energy efficiency programs for their customers as an alternative to constructing new power plants or purchasing natural gas. The goal is to meet customer needs at the lowest cost with improved services and the least adverse impact on the environment.

### Open competition

MG&E will compete with consultants, contractors or other utilities to achieve energy efficiency results in the industrial, commercial and rental sectors of its marketplace. One competitor will be selected on the basis of bids to compete with MG&E in each of the three areas. There could be a total of as many as three competitors or as few as one for all three. MG&E and its competitors will be allowed to spend up to a total of $1.8 million for their combined programs in the three sectors.

The program will run for nine months. At the end of the period, the organization in each sector that has been the most successful—either MG&E or its competitor—will be paid a bonus of 10 to 30 percent of the cost of the program.

The competitor in each sector will be selected on the basis of five criteria: 1) Assurance that the program will achieve at least a minimum level of conservation, 2) Documentation of ability to actually carry out a program competitive with MG&E, 3) Method of documenting actual savings, 4) Previous experience, qualifications of staff, adequate financing, etc., and 5) Degree to which the competitive program differs from that offered by MG&E.

The commission solicited bids from potential competitors in mid-July. Competitors then prepared presentations detailing costs and benefits of their programs. Selection of a competitor for MG&E for each sector was made by a panel consisting of one representative each from the PSC, Madison Gas & Electric and an outside organization agreed upon by the MG&E and the PSC. As *EL&P* went to press, the probable third person on the selection panel will represent Alliance to Save Energy, a conservation and lobbying group.

The commission said it expects to select competitors and have the programs launched by mid-September.

The PSC's Office of Conservation and Energy Efficiency asked the commission to require competition for conservation services to inspire better results. George Edgar, a PSC commissioner, commented that "Competition is a promising way for consumers to have an opportunity to achieve lower energy bills. With only the utility running efficiency programs, it is difficult to determine whether as much energy efficiency as possible is achieved and whether it is achieved at the lowest cost."

The commission says that the competition is not just for price, but also for overall performance. Success will be measured both in the cost-effectiveness of programs for customers and for their benefits to the utility system. "This gives us the opportunity to compare the results of a competitive system with the more traditional monitoring by commission staff," added Mary Lou Munts, another commissioner.

## 'Buy American' policy continued for FY '89

WASHINGTON—The Tennessee Valley Authority, Bonneville Power Administration and other federal agencies will be required to apply a special 30 percent "Buy American" differential during fiscal year 1989 when considering procurement of EHV equipment from overseas—for the fourth consecutive year.

The law applies to all ac and dc apparatus to be operated on federal systems rated above 242 kV.

The provision, which was included in the Energy and Water Development Appropriations Bill for Fiscal Year 1989 (HR 4567), is an effort to increase pressure on foreign governments to provide access to their electric utility markets. The bill, sponsored by Rep. Silvio O. Conti, ranking minority member on the House Appropriations Committee, was signed by the President in late July.

The purpose of the requirements is to reduce the price differentials between U.S.-made equipment and the low-priced equipment manufactured in countries with protected utility markets, where U.S. manufacturers are either precluded from selling by law or by policy. Most foreign utilities are owned by their governments and are required to follow "buy national" practices.

The bill provides an exception to EHV equipment vendors from countries that demonstrate they allow fair competitive opportunities to U.S. electrical apparatus manufacturers.

## DOE selects GE for advanced reactor

WASHINGTON—The Dept. of Energy selected General Electric Co. to conduct a three-year program to develop an advanced liquid-metal reactor (LMR) powerplant, with an optional, two-year, follow-on design effort. The value of the five-year contract was estimated at $93.5 million.

The LMR design could lead to important advances in safety and economics through increased use of passive safety features that allow for simpler design that is more tolerant of operator error and equipment malfunction.

The technology is based on the Power Reactor Inherently Safe Module (PRISM) design that DOE has been developing for three years.

The concept uses a modular approach to produce 450 or 465 MWe. Provisions will be made for several modules to be constructed at one site, which should give further cost savings.

GE will head a design team that includes Bechtel National, Westinghouse Electric Corp., Burns & Roe, Babcock & Wilcox, Foster Wheeler Energy Applications Inc., Byron Jackson Products, and United Engineers & Constructors/Stearns-Rogers.

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OCTOBER 1988

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VOICE OF THE ELECTRIC UTILITY INDUSTRY

# PSNM slashes staff

## Matches TVA's 20% cut; Duke may trim 10%; streamlining for the '90s?

ALBUQUERQUE, NM—In an effort to reverse a deteriorating financial position, and maintain its dividend of $1.52/share, Public Service Company of New Mexico announced staff cuts of 799—19.4 percent of its work force—effective Oct. 30.

**Duke studying cuts**

Duke Power Co. recently announced a company-wide evaluation that could trim 10 percent of its workforce. As previously reported, Tennessee Valley Authority in June cut 7500 personnel, 20 percent, as a reorganization effort to cut costs and check rate increases in the name of competition.

The PSNM cuts reduce salaries, wages and benefits by $28.4 million. Additionally $15.4 million was cut in non-labor operations expenses. Construction expenses were cut by $19 million in 1988 and by $33.6 million from budgeted 1989 levels.

PSNM work force is now 3327 people, down 976 jobs from peak employment of 4303 in 1985.

"We are taking drastic steps to assure the survival of our company and renew our core business as electric, gas and water utility services," said PSNM Chairman and President Jerry Geist about the Aug. 30 announcement.

"The reduction in our staff is the most difficult step to take, but one that was absolutely necessary to assure PSNM's long-term financial survival and competitiveness," he said.

"Our earnings dropped 38 percent between 1986 and 1987 and continued to decline in the first half of this year," he said. Dividends also have been reduced by nearly half.

PSNM's common stock price, which was 39⅛ last March 13, fell to 12⅝ Aug. 29, the lowest since 1974. By Sept. 9, it had risen slighdy to 14½.

**Number of cuts**

PSNM staff cuts include 35 executives, 27.6 percent, and 764 non-executives, 19.1 percent. The reductions include 74 vacant positions. Various employee-severance plans and career-counseling programs were set up to help those affected.

The breakdown is as follows: corporate office 47, 30.5 percent; electric

Continued on page 12

## LATE NEWS

**PS of New Hampshire's** Robert J. Harrison, president and chief executive officer, resigned, citing health problems. John Duffett, chief operating officer and executive vice president, replaced him. (See related story, p.13.)

**A $4-billion, 2000-MW,** coal-fired plant is proceeding with permitting and licensing at the Thousand Springs site, in northeast Nevada. The first 250-MW unit is scheduled for completion in the mid '90s. Wholesale power will be sold to Western utilities. Project owners are: Bonneville Pacific Corp.; Coastal States Energy Co.; Foster Wheeler Energy Corp.; Robert L. Helms Construction & Development Co.; Kidder, Peabody & Co.; Pittsburg & Midway Coal Mining Co.; Sierra Pacific Resources; and Westinghouse Electric Corp.

# Nuclear battery seen in two yrs; prototype works

PORTLAND, OR—Peripheral Systems Inc. is continuing with development of a nuclear battery that it says will produce alternating current at 3¢/kWh or less. The company hopes to go commercial with the battery in two years.

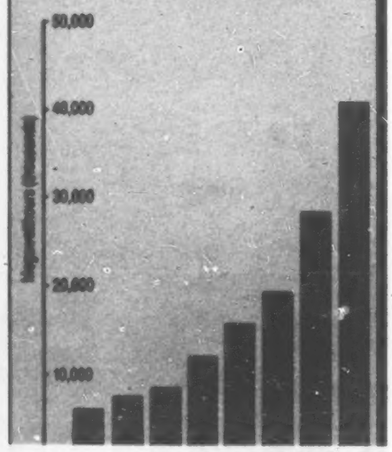
Such a battery could provide up to 100 kW, from used fuel from nuclear power plants or other radioactive isotopes, say company officials.

In June, Peripheral Systems acquired 51 percent of Nucell, the company that carried out the initial research on this nuclear battery concept. Peripheral had provided the research-and-development funding for Nucell's radio-

Continued on page 11

## ENERGY FROM NONUTILITIES

Nonutility producers accounted for 3.5 percent of U.S. electrical generating capacity in 1986, according to the Edison Electric Institute. This was a 10-percent increase over 1985. In a first-of-a-kind report, EEI notes that cogenerators supplied 18,448 MW, and small- and independent-power producers gave 6873 MW to this total. All three generated 112,008 GWh in 1986, or 14 percent more than in '85. Of this amount, 40,719 GWh was supplied to electric utility systems in 1986. (See story, p. 27.)



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# SDG&E tells SCEcorp no; TEP pleased

SAN DIEGO—San Diego Gas & Electric Co.'s board of directors announced its unanimous decision to reject SCEcorp's unsolicited buyout offer and to proceed with the previously announced merger with Tucson Electric Power Co. SCEcorp officials promised, for now, to leave open the offer.

The final word remains to be heard, however. Several shareholder suits were filed against SDG&E after its announcement.

To hear executives from SDG&E and SCEcorp talk about the spurned offer, one would think the two sides were looking at different proposals entirely (*EL&P*, September, p.1).

Thomas A. Page, chairman, president and chief executive officer of SDG&E, said "While the SCE proposal represented potential short-term benefits to our shareholders, our board believes that the long-term benefits expected to result from continuing to pur ategic goals, including the , outweigh the short-term he SCE offer."

Howard P. Allen, chairman and chief executive officer of SCEcorp and its electric subsidiary Southern California Edison Co., was amazed the

Continued on page 13

## Limestone is on time, under budget

Limestone Generating Station, on the Nelson River in Manitoba, about 160 miles south of Churchill, is not only being built on schedule but also is coming in approximately $60 M (Canadian) under budget. The first two generating units of the 1280-MW hydroelectric plant are expected to be powered-up in 1990, with the last three of the ten due online in 1992. Draft-tube openings (above) into the tailrace area will handle the flow from the turbines. The adjoining spillway has seven gates capable of passing 9500 m$^3$/sec of water. Embedded parts (at right) for the No. 1 fixed-blade propeller turbine are installed in the powerhouse. When the facility is finished, the power will be used in Manitoba and for export to Northern States Power Co.

# NEWS BRIEFS

**JILL MINNER**, Assistant Editor

## NBS takes on new name, responsibilities

The National Bureau of Standards became the National Institute of Standards and Technology (NIST) recently, when President Reagan signed the Omnibus Trade and Competitiveness Act into law, according to the U.S. Department of Commerce. In addition to its current responsibilities, NIST will receive several new assignments designed to boost U.S. industry in the world marketplace. The Commerce Department said that, under the new law, NIST has until December 21 to submit a new organization plan to Congress.

## K-Fuel M&D plant moves to start-up phase

The K-Fuel Modification and Development plant has received its first trial runs of coal and is moving into start-up phase, according to Fluor Daniel. The plant is a demonstration unit that Fluor Daniel has been working on for Energy Brothers, an affiliate of the project's owner, K-Fuel Partnership. The K-Fuel process removes water and oxygen from coal to enhance the calorific value of low rank fuels while also reducing sulfur content.

## The Southern Co. and Florida Power finalize power supply contracts

The Southern Company announced that its five operating units—Alabama Power, Georgia Power, Gulf Power, Mississippi Power and Savannah Electric—will supply coal-fired electricity to Florida Power & Light Co. and the Jacksonville Electric Authority. Agreements between The Southern Company and Florida Power Corp. cover sales of up to 1500 MW over a 17-year period beginning in 1993. "We believe our customers and stockholders will benefit from these transactions because, in the mid-to-late 1990s, we can meet the additional energy demand we're projecting for our own service area with other alternatives such as peaking units," explained Southern Company President Edward L. Addison.

## Baukol-Noonan, Inc. and Minnesota Power sign merger agreement

According to Minnesota Power, it has signed a definitive merger agreement with Baukol-Noonan, Inc. under which the company will become a wholly-owned subsidiary of Minnesota Power. Headquartered in Minot, ND, Baukol-Noonan is involved in surface mining and the sale of lignite coal in North Dakota.

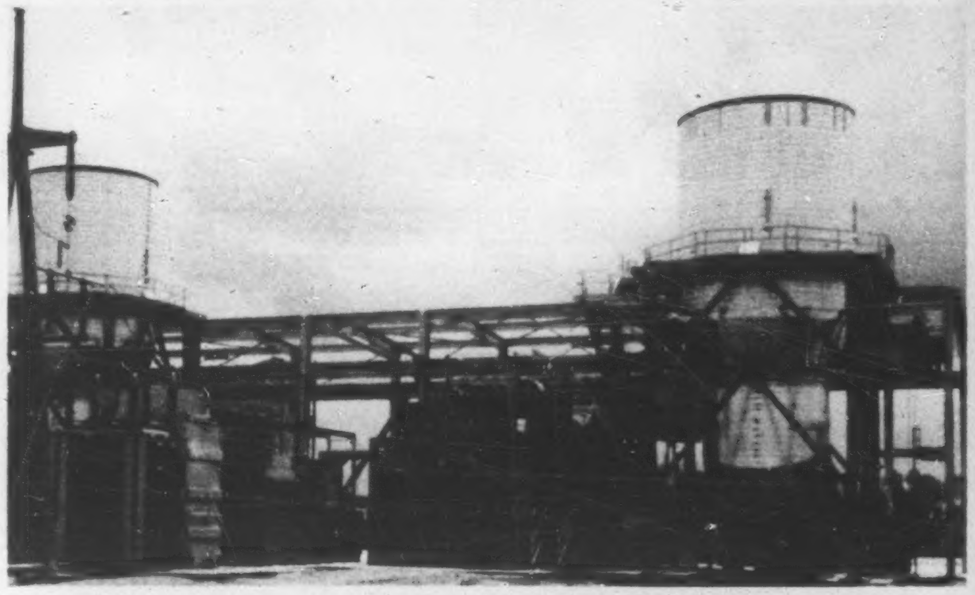
## Black & Veatch buys resource recovery firm

Black & Veatch has acquired REFCOM Corporation, a design firm specializing in resource recovery projects. Black & Veatch, an engineering and architectural design firm, said it has designated REFCOM's Richmond, VA location as its regional office.

## General Cable, Capital Wire & Cable merge

Penn Central Corp. said it has purchased Capital Wire & Cable Corp. for about 850 million. Capital will be merged with General Cable Co.'s Guardian Products division, a unit of Penn Central Telecommunications Co. Guardian President Eugene J. Tonkovich said the union will enable General Cable to supply a broader line of electrical and electronic products to the electrical distribution, construction and electric utility markets.

## TU Electric orders six gas turbines from GE



Texas Utilities Electric Co. has ordered six MS7001EA gas turbine-generator sets from General Electric to meet peaking load requirements, according to GE. Four of the units are scheduled for installation at TU Electric's DeCordova power plant, while the other two will be sent to the utility's Permian Basin power plant where three GE units are already operating. GE said it will begin shipping the units in February, and expects them to be in service by the summer of 1990.

## NPPC votes in favor of protected wildlife areas

The Northwest Power Planning Council (NPPC) has voted to adopt an action which will designate "protected areas" for fish and wildlife populations that have been harmed by hydroelectric development in the Columbia River Basin. NPPC said the areas would cover habitat for critically important or endangered wildlife and sections of streams with critical habitat for fish and wildlife. The council was formed by the states of Idaho, Montana, Oregon and Washington under authorization of the Northwest Power Act of 1980. While NPPC cannot prohibit hydropower development, the Federal Energy Regulatory Commission must take the council's program into account in its decision-making process, according to the terms of the Act.

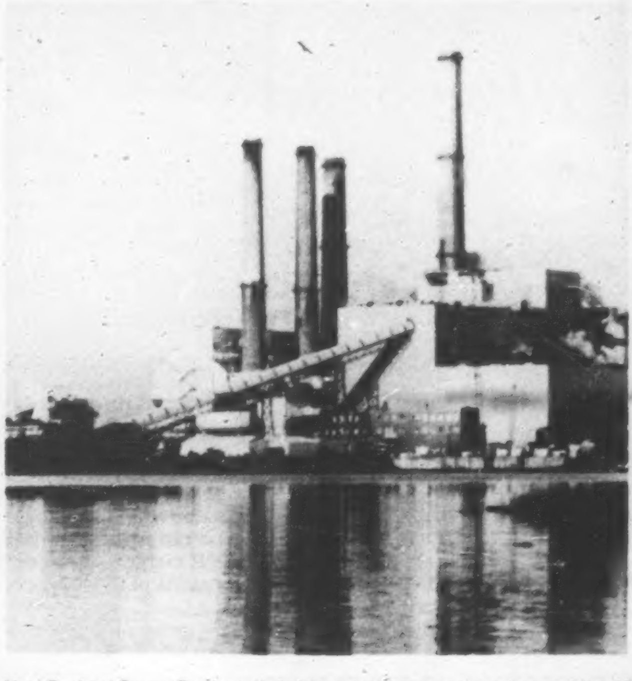
## October is 'Energy Awareness Month'

The Department of Energy has designated October as 'Energy Awareness Month' as part of the eighth annual National Energy Awareness campaign. DOE said it is sponsoring the 'month' to promote a better understanding of the role of energy in the economy, and the importance of energy to the nation's health, welfare and national security.

## Herrington appoints SWPA administrator

J.M. Shafer has been named administrator of the Southwestern Power Administration (SWPA) by Department of Energy Secretary John S. Herrington. Shafer, formerly SWPA deputy administrator, succeeds the retiring Ronald H. Wilkerson.

## NEP's Brayton Point-1 celebrates 25th



New England Power Co. recently held an anniversary celebration marking 25 years of commercial operation at Unit 1 of its Brayton Point Station. NEP said its fossil fuel power plant generates over 1500 MW of electricity and consumes about 3 million tons of coal and more than 3.2 million barrels of oil annually.

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ELAP readers whose responsibilities include both Generation and Transmission/Distribution receive both technology sections. Other readers receive the technology section that applies to their respective area of responsibility. The Generation edition is indicated by a single dot (·) in the upper right corner of page 1; the T/D edition carries two dots (··). All readers receive ELAP's industry news section.

# COMMENTARY

## Nope on NOPRs

**The Federal Energy Regulatory Commission has made a sincere effort to correct and amend the Public Utility Regulatory Policy Act of 1978. But it is important that this effort, as demonstrated in the four Notices of Proposed Rulemakings (NOPR) currently pending before the Commission, be carefully analyzed and reworked...substantially reworked.**

**The NOPRs, according to FERC, would amend and clarify PURPA regulations currently in effect. They also would encourage cogeneration and small power production, energy conservation, efficient use of facilities and resources by utilities and promote fair and equitable rates for customers. They would initiate procedures for competitive bidding for utilities' business and establish independent power producers as a new class of power supplier.**

**Modification of PURPA regs is long overdue. Congress evidently didn't believe in the old adage that "if it ain't broke, don't fix it," when it wrote the initial legislation a decade ago. As a result, the initial regulations created many problems by requiring utilities to buy cogeneration power at "avoided costs" that, in some cases, were higher than the utility's cost of generation.**

**It is important that such inequities be corrected. At the same time, care must be taken to ensure that new punitive regulations aren't created. Specifically, utilities must be given the option to purchase from non-utility suppliers or generate their own power, depending on the economics *and* the evaluated nature of the non-utility bid. The utility has the responsibility to serve; therefore, it needs the option to decide on a non-utility generator's commitment and ability to serve, as well as the real price of power for each bidder. To force purchase of electricity generated outside a utility's system, to preclude the utility providing the service itself, would establish an entire new power supply system, a system that has not been tested and which *could* result in severe inconvenience to customers, as well as higher-than-necessary prices.**

**The question of how there can be a open competition in the generation marketplace without some form of transmission access has not been addressed either. Public power spokesmen and some non-utility generators are calling for open access for all. But no one as yet has tackled the complex question of how a transmission system can be operated reliably if subject to in-again, out-again generation from diverse non-utility generation sites operated at the discretion of the generators. Owners of transmission facilities, who are responsible for service to ultimate customers, must continue to control the transmission network. Flexible pricing and specific contractual commitments by non-utility generators are essential.**

**FERC's NOPRs represent substantial improvements in PURPA regulations, but further effort is needed if they are to provide workable, real-world procedures that will improve the quality of the power supply and guarantee optimal rates for consumers over time.**

## How does Zimmer stack up?

Work on the Wm. H. Zimmer Generating Station's 573-foot stack will continue through November as part of the multi-million dollar air-quality control system that includes electrostatic precipitators (right) and a flue-gas desulfurization system. Far right, steel erection on the boiler building is underway. Owned by Cincinnati Gas & Electric Co., Columbus Southern Power Co. and The Dayton Power and Light Co., Zimmer is a coal-fired conversion of a nuclear plant, to operate in 1991.

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# LETTERS

## Ductwork corrosion

In the February issue (p. 17) I noticed an article concerning ductwork corrosion. Battelle Columbus Div., in conjunction with EPRI, has started a two-year program to test different metals and/or non-metallic coatings as combatants to the aforementioned corrosions. Since I have already been through some of these tests, successes, failures and evaluations, I can speak with some expertise on the subject.

At one of TU (Texas Utilities) Electric lignite-fired plants, a mandatory survival operation was implemented to sustain the ductwork not already deteriorated to the point of failure. This undertaking was mandated by the metal duct fatigue, buildup of carryover ash and the strong desire of company leaders to provide safe, reliable and economical power to our customers.

Martin Lake Steam Electric Station is located approximately 150 miles southwest of Dallas in the "Lignite Belt." Three 750-MW units with wet limestone FGD systems were started up in the late 1970s and problems with the ductwork became apparent very quickly. The wet discharge from the scrubber towers mixing with the high sulfur-content gases in the bypass duct was a primary target of concern. Later, the scrubber towers, AFT tanks and associated piping became concerns also.

After five years of testing metals, coatings, applications, applicators, operating criteria changes and maintenance methods, as well as expending many millions of dollars along with a lot of long, hard work, progress was made to provide safe, reliable and more economical power.

Many engineers, contractors, vendors and other TU employees contributed to the answers that have been gathered to the many questions we had at the onset. Some questions still remain, and no doubt many more will come up as further progress is made. However, without an understanding management team behind us, very little progress could have been made.

If the people at Battelle would consider using information from some "good ol' boys" from Texas, I can refer them to some people that have gained, as I did, first-hand knoweledge and learned some do's and don'ts about ductwork corrosion and repair.

*C.R. Wilkerson*
*Project Management Specialist*
*TU Electric*
*Tyler, TX*

## Transmission tower coatings

The article entitled "Coatings judged 'most promising' for tower protection" (August *EL&P*, p.31) contains a misleading statement. Perhaps a few comments will put the subject in perspective and prevent interested readers from getting the wrong impression.

Bare weathering steel towers have been used in transmission lines in the U.S. for nearly 25 years. After a decade or so of exposure to the atmosphere, rust packout can form on the faying surfaces inside the belted connections, and cause members to deform. In some cases, the packout can achieve thicknesses of ⅜- to ½-in. The appearance of such a joint can be startling and raise questions concerning the integrity of the involved structure.

Nine utilities with a significant number of weathering steel towers on their systems co-sponsored an extensive study into the packout phenomenon. The study consisted of two separate and parallel investigations.

The first was designed to determine the effect packout had on the integrity of standing towers, as well as on their expected useful lives. Non-destructive evaluation techniques were employed to inspect a statistically significant sample of weathered towers. Packed-out joints were sent from the field to a structural laboratory and were tested in comparison with similar-sized joints made from non-corroded members. In addition, packed-out joints were tested *in-situ* in the field and compared with replacement joints made from similar-sized, non-corroded members.

In the article, the statement is made in paragraph three "Pack rust is the accumulation of rust in crevices and bolted connections that eventually can loosen joints and adversely affect the safety and integrity of utility towers." This statement is not consistent with the facts. The lab and field tests conducted indicated that packout *tightened* and, in fact, *strengthened* the joint. In addition, this phase of the study showed that the packout phenomenon, by itself, does not cause a measurable decrease in the expected useful life of the structure.

The second part of the study is the one referred to in the article. Its objective was to assess, by means of accelerated lab tests, the available coating systems for potential application where needed to take care of specific micro-environmental conditions. The article properly identifies the coating systems that appear to have the best combination of application and protection properties. These coating systems have been used in trial applications on operating utility structures and are under observation at this point in time.

The research team for the project concluded that such coatings should be considered for specific application to joints where the packout is not mechanically sound or missing for any reason, as well as for general application to structure surfaces in locations where it will stay wet for long periods of time.

Anyone desiring more information can contact the writer.

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## Energy storage

In an Edison Electric Institute publication titled "Electricity: Sources and Technologies," I read this astounding sentence:

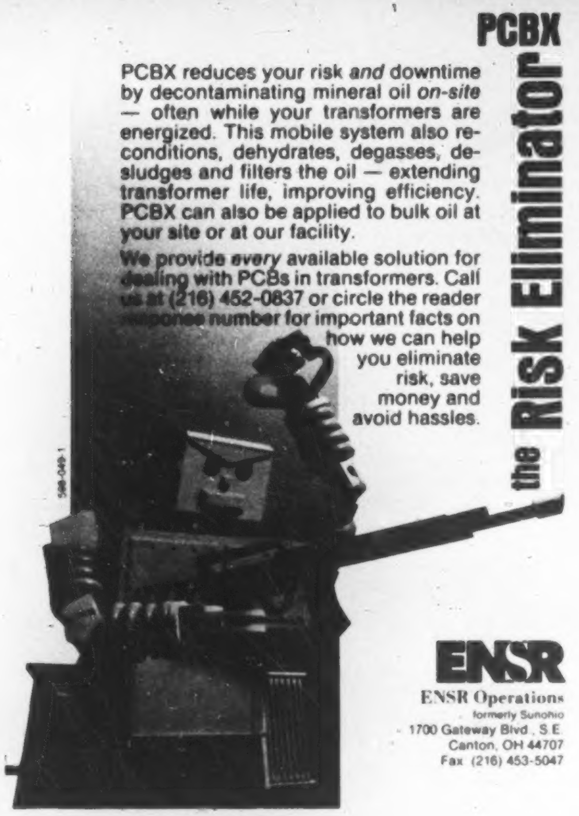
*If a person were to think of one single thing to truly revolutionize electric power production in the U.S., it would be to find an economical method of storing energy.*

I have studied energy conservation methods, worldwide, for some years and so became aware of six economic, non-polluting methods to store energy produced during off-peak hours for use during peak hours. For some unknown and puzzling reason, we in the U.S. use only ice (and cold water) storage, and then only on a limited basis.

As I understand the Edison Electric Institute's statement, we could supply the entire U.S. with all the power we need, but with possibly only two-thirds of our base-load generating plants operating around the clock at full capacity, thereby efficiently storing electricity rather than all of them idling inefficiently during off-peak hours, burning fuel but producing and selling little power.

Further, with sufficient energy storage means in-place, we could eliminate, gradually but totally, the costly upkeep and use of oil- and gas-burning peaking plants and their consequently expen-

Continued on page 27



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# APPA, EEI ratios: how does your utility compare?

WASHINGTON—How does *your* utility stack up against published average financial ratios?

The question arose as a result of a new publication from the American Public Power Association that provides a number of operating and financial ratios from its members. No matter what the answer is, however, APPA warns utility managers and executives to use financial ratios with caution.

"The ratios, by themselves, do not provide definitive answers [to improving efficiency]; rather, they are the starting point for an informed evaluation of a utility's operations," says the introduction in American Public Power Association's "Selected Financial and Operating Ratios for Public Power Systems, 1986," released in June.

In the following table, *EL&P* has given some of the more important APPA-member ratios and has added comparable ratios for investor-owned utilities, taken from the Edison Electric Institute's "Statistical Yearbook of the Electric Utility Industry for 1986."

John Kelly, APPA director of economics and research, advanced additional cautions when comparing investor-owned and public utilities.

"Net income of nonprofit utilities is necessarily lower because the return is realized through lower rates," Kelly said. "Return to private utilities pays dividends and stock appreciation." He did not mention the added taxes that investor-owned utilities pay.

Because of that, and slight differences in definitions, "a simple comparison of investment figures leaves a lot to be desired," Kelly explained.

Still, Kelly continued, utility executives should be interested in analyzing and comparing the figures to their own.

### Terms defined

For comparison, APPA makes the following distinctions:

- Customer size classes refers to ultimate customers served by the utility.
- Return on investment is net income divided by total investment and surplus (total capitalization).
- Debt-to-equity ratio is the total long-term debt and total current and accrued liabilities divided by total assets and other debits.
- Operating ratio is total electric operating expenses, less depreciation and amortization, divided by electric utility operating revenues.

Kelly said he's working on a number of revisions of ratios and information for the next report. The 1986 edition was the first.

The 42-page APPA report offers data on 17 catagories of financial and operating ratios for 400 U.S. public power systems with retail sales of 100,000 MWh or more. Joint-action agencies are not included. The report may be ordered by writing APPA, 2301 M Street NW, Washington, DC 20037 or calling 202/467-2908.

**Comparison of Public Power and Investor-Owned Utility Financial Ratios**

| | Public Power '86† | IOU '86* | IOU '87* |
|---|---|---|---|
| Revenue/kWh (Dollars) | | | |
| All Retail Classes | 0.064 | 0.0670 | 0.0686 |
| Residential | 0.068 | 0.0776 | 0.0775 |
| Commercial | 0.060 | 0.0740 | 0.0724 |
| Industrial | 0.047 | 0.0512 | 0.0492 |
| Revenue/Customer (Dollars) | | | |
| All Retail Classes | 1369 | 1938 | 1652 |
| Residential | 595 | 665 | 663 |
| Commercial | 3300 | 4467 | 4530 |
| Industrial | 40,633 | 89,819 | 87,726 |
| Return on Investment | 0.066 | 0.063 | 0.066 |
| Debt-Equity Ratio | 0.807 | 0.457 | 0.465 |
| Operating Ratio | 0.780 | 0.705 | 0.691 |
| Net Income/Revenue Dollar | 0.100 | 0.159 | 0.150 |
| Retail Customer/Employee | 182 | 161 | NA |

†"Selected Financial and Operating Ratios of Public Power Systems, 1986," by American Public Power Association, June 1988.

*"Statistical Yearbook of the Electric Utility Industry," by Edison Electric Institute, 1986. 1987 figures are preliminary.

# 1988 estimates of coal use increase

WASHINGTON—The strength of the fourth-quarter production and utility coal consumption, along with a second summer of abnormally hot weather and drought led the National Coal Association to increase its estimates of total U.S. coal consumption for 1988.

A second consecutive record year is now anticipated, a significant revision from the December 1987 estimate of 1988 production.

Total coal production of bituminous, lignite and anthracite coal is forecast to total 926-million tons this year, 9 million more than the record 917-million tons produced in 1987, according to the midyear forecast of coal markets prepared by the association's Economic Committee.

**Electric Utilities Percent Generation by Fuel**

| Year | Coal | Oil/Gas | Nuclear | Hydro/Other | Electricity Growth Rate % |
|---|---|---|---|---|---|
| 1985 | 56.8 | 15.9 | 15.5 | 11.8 | 2.2 |
| 1986 | 55.7 | 15.5 | 16.6 | 12.2 | 0.7 |
| 1987 | 56.9 | 15.2 | 17.7 | 10.2 | 3.4 |
| 1988* | 56.5 | 15.0 | 18.2 | 9.3 | 2.9 |

*Consensus forecast

Source: National Coal Association

Including imports, coal available for sale produced in the U.S. is expected to total 932-million tons, 15-million tons (1.6 percent) greater than 1987.

### Coal share down

Despite those anticipated overall increases, coal's share of the electric utility market is expected to fall slightly to 56.5 percent, primarily from increased nuclear generation and strong competition from other fuels.

Utility coal consumption is expected to reach 733-million tons in 1988, an increase of 15-million tons over 1987 levels and a new usage record by the industry.

Slightly more than 2.6 GW of new coal-fired power came on line in 1987, and an additional 1.8 GW are expected in 1988 in Florida, Texas and Georgia.

Economic forecasts call for the real rate of growth in GNP to be 2.9 percent in 1988, about the same as 1986 and 1987. The growth in GNP—3.6 percent for first-quarter 1988—should be higher in the first half of 1988 than in the second half of the year. The rate of increase in industrial production, as measured by the Federal Reserve Board's Industrial Production Index, is expected to slow slightly from 1987 and increase by 3.2 percent in 1988. The rate of increase in electrical generation is also expected to be slightly lower this year, 2.9 percent versus the 3.4 percent in 1987.

John Grasser, an NCA representative, said the revised projections do account for the summer's heat wave, but said the percent increase could be greater if severe weather persists.

### Unanticipated strength

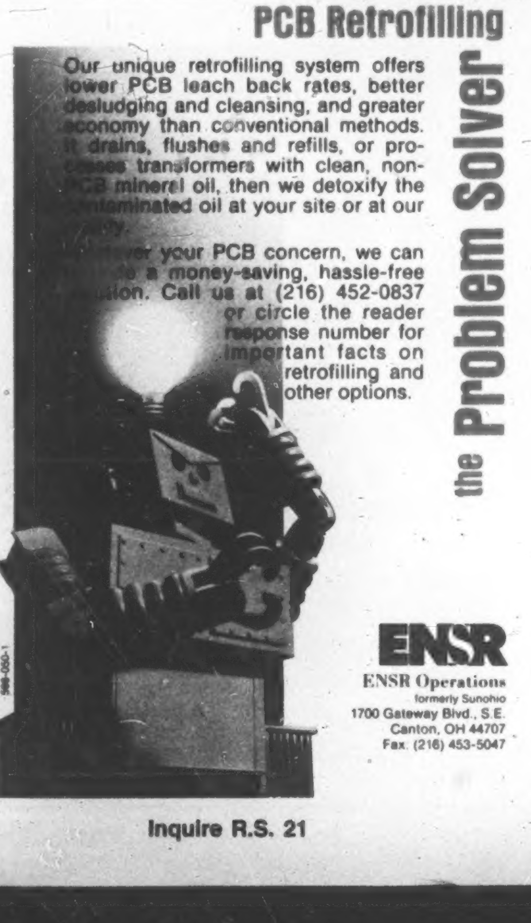
"The unanticipated strength in both indicators is led by manufacturing activity of the export market; retail spending for consumer durables is also higher than earlier forecast, adding to the growth in real GNP," the NCA forecast pointed out.

# NRC increases plant fees 12%

WASHINGTON—Nuclear Regulatory Commission fees for all licensed power reactors will increase 12 percent, or an average of $350,000 per unit per year. The additional fees are to cover NRC-incurred generic regulatory costs and apply to all licensed power reactors, with exceptions for R&D and other specific non-commercial purposes.

The Omnibus Budget Reconciliation Act of 1987 requires the NRC to collect 45 percent of its $392.8-million fiscal-1988 budget, or $177 million, from the reactor systems it regulates. Last year, the NRC collected only 33 percent, or $132.3 million, out of a total budget of $409.5 million.

Commonwealth Edison Co., the nation's largest nuclear utility, will pay more than $15.4 million in 1988 fees to the NRC for its 12 nuclear units, a company spokesman said.



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